

**VIOLENCE VICTIMIZATION AND VIROLOGIC FAILURE
AMONG ADOLESCENTS AND YOUNG ADULTS LIVING
WITH HIV IN ZAMBIA**

by
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Abstract

Background: Data are lacking on the prevalence and perpetrators of violence against adolescents and young adults (AYA) living with HIV in sub-Saharan Africa and how violence may relate to HIV outcomes. This dissertation used a sequential mixed-methods design to study the relationship between violence victimization and virologic failure among AYA in Ndola, Zambia.

Methods: We analyzed baseline trial data from 272 AYA (15-24 years), consecutively sampled from four HIV clinics. We estimated the weighted prevalence and perpetrators of physical violence, psychological abuse, and forced sex. Using logistic regression, we derived associations between multiple forms of past-year violence victimization and viral load (VL) failure ($\geq 1,000$ copies/mL). In-depth interviews with 41 AYA with varied experiences of violence and VL were thematically coded.

Results: Almost three-quarters of AYA experienced any past-year violence (72.0% male, 74.5% female); males experienced more violence than females from a friend/peer (74.3% vs. 45.1%, $p < 0.001$), while females experienced more than males from a romantic partner (33.3% vs. 5.0%, $p < 0.001$), parent/caregiver (32.4% vs. 17.6%, $p < 0.05$), and stranger (19.7% vs. 5.2%, $p < 0.001$). AYA with a high frequency of any violence (scores of 12-42) versus none (adjusted odds ratio, aOR: 3.58; 95%CI: 1.14-11.27) and a high frequency of psychological abuse (scores of 6-18) versus none (aOR: 3.32; 95%CI: 1.26-8.70) had greater odds of VL failure. Regarding perpetrators, we found any versus no violence from a family member other than a parent/caregiver for physical violence (aOR: 2.18, 95%CI: 1.05-4.54), and psychological abuse (aOR: 2.50; 95%CI: 1.37-4.54), as well as any versus no physical violence from a friend/peer (aOR: 2.14, 95%CI: 1.05-4.36), were

associated with VL failure. Two-thirds of qualitative participants described negative effects of violence on their HIV self-management. Verbal abuse—especially in homes and schools—and sexual violence against females were particularly damaging. AYA described physical discipline as having few effects.

Conclusions: Violence is related to VL failure and may be critical to address to improve AYA virologic outcomes. Prevention and response efforts are needed in HIV clinics, homes, communities, and schools to support AYA who experience a high frequency of violence, especially psychological abuse, and violence from family members and peers.

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List of Terms and Abbreviations

aOR: adjusted odds ratio

ADCH: Arthur Davison Children's Hospital

ART: antiretroviral therapy

AYA: adolescents and young adults

CI: confidence interval

DHS: Demographic and Health Surveys

GBV: gender-based violence

HCP: healthcare provider

ICAST-C: The International Society for the Prevention of Child Abuse and Neglect
Screening Tool-Child Instrument

IDI: in-depth interview

IPV: intimate partner violence

NTH: Ndola Teaching Hospital

PCC: primary care clinic

Project YES!: Project Youth Engaging for Success!

RA: research assistant

RCT: randomized controlled trial

SSA: sub-Saharan Africa

SD: standard deviation

VACS: Violence against Children Surveys

VL: viral load

WHO: World Health Organization

WHO MCS: World Health Organization Multi-Country Study on Women's Health and
Domestic Violence against Women

Chapter 1. Introduction

1.1 Study goal and specific aims

HIV and violence are key concerns among adolescents and young adults (AYA), ages 15-24 years, in sub-Saharan Africa (SSA). SSA is home to over 80 percent of the world's AYA who are living with HIV.¹ These AYA experience lower levels of antiretroviral therapy (ART) adherence and viral suppression compared to adults.^{2, 3} They also reside in a region with one of the highest rates of violence against AYA in the world, with the prevalence of physical, emotional, or sexual violence ranging from about 30 to 50 percent in some African settings.^{4, 5}

Despite the prominence of these public health threats, we know little about the epidemiology of violence victimization or how it affects HIV outcomes among AYA living with HIV in the region. Only three studies—all quantitative—were identified which examine this relationship among young people in Malawi and South Africa, each finding that experiences of violence from a range of perpetrators are associated with incomplete ART adherence.⁶⁻⁸ These results echo a broader body of literature among adult women, which shows violence from an intimate partner as a barrier to desired HIV outcomes.^{9, 10} No studies on this topic were found from Zambia, where youth face high levels of violence^{11, 12} and more virologic failure than adults.¹³ The lack of data from the region—and Zambia specifically—is concerning since AYA are undergoing cognitive, psychosocial, emotional, and social changes^{14, 15} and therefore face different challenges than adults.

The goal of this dissertation was to examine the relationship between violence victimization and viral load (VL) failure among AYA living with HIV, aged 15-24 years, in Ndola, Zambia. Quantitative analyses drew on baseline data from the Project YES! (Youth Engaging for Success) randomized controlled trial (RCT) with 272 AYA from across four HIV clinics. Qualitative data collection and analyses took the form of in-depth interviews (IDIs) with a subset of 41 AYA enrolled in the trial. The dissertation incorporated three specific aims:

- Aim 1: Estimate the prevalence and identify perpetrators of violence against AYA living with HIV.
- Aim 2: Assess associations between past-year violence victimization and VL failure among AYA.
- Aim 3: Explore the intersection between AYA experiences of violence and HIV outcomes.

1.2 Definitions

Below are definitions of key terms used through this dissertation (quantitative measures are detailed more thoroughly in the Methods sections).

Adolescence

Adolescence is a period of life associated with specific developmental changes and needs.¹⁶ The World Health Organization (WHO) highlights that the transition between childhood and adulthood is defined and recognized differently across cultures and over time.¹⁶ We draw on the Lancet Commission on Adolescent Health and

Wellbeing definition of adolescence as comprising older adolescents, ages 15-19 years, and young adults, ages 20-24 years.¹⁷

Virologic failure

In line with consolidated guidelines on HIV treatment and prevention from the Ministry of Health in Zambia¹⁸ and the WHO,³² we define virologic failure as $\geq 1,000$ copies of HIV-RNA/mL. Virologic failure is contrasted with viral suppression, which occurs when the amount of the virus in a person's blood is lowered below a threshold, thus improving health and reducing the likelihood of onward HIV transmission.

Violence

We use the WHO's definition of interpersonal violence as: "the intentional use of physical force or power, threatened or actual, against...another person...that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation."¹⁸ The following three forms of violence victimization are assessed: physical violence (e.g. slapping, hitting), psychological abuse (e.g. humiliation), and sexual violence (e.g. forced intercourse).¹⁹ We focus on victimization to distinguish from other definitions of violence, such as witnessing or perpetrating violence.

1.3 Organization of the dissertation

Chapter 2 provides a review of the literature on HIV and violence among young people in SSA and the unique developmental stage of our study population. Chapter 2 also offers a description of the study setting, including an overview of the country/site context and the intersection between HIV and violence in Zambia. Chapter 3 provides a

summary of the study methods and a description of the parent study within which data were collected, the theory and conceptual framework that guided the dissertation, and an overview of ethical considerations that underpinned this research.

Chapters 4 through 6 present the research on the relationship between violence victimization and VL failure through three distinct but inter-related manuscripts, written to be submitted to peer-reviewed journals. Manuscript 1 (Chapter 4) offers a detailed look at the epidemiology of violence against AYA living with HIV in Zambia through an examination of the prevalence and perpetrators of violence. Manuscript 2 (Chapter 5) presents results on the associations between experiences of past-year violence victimization and VL failure among the AYA. Manuscript 3 (Chapter 6) provides a deeper contextual understanding of the intersection between violence victimization and HIV outcomes through IDIs with AYA.

Chapter 7 discusses the key findings from this dissertation research, returns to the study's theoretical orientation and conceptual framework, and presents the study's strengths and limitations. Chapter 8 concludes with study implications for future research, practice, and policy.

Chapter 2. Literature review and study setting

2.1 HIV among adolescents and young adults in sub-Saharan Africa

Significant progress has been made in HIV prevention, care, and treatment in the past decade, in efforts to counter an epidemic that has claimed 32 million lives globally.²⁰ AIDS-related deaths have declined by more than 56% since the death rate peaked in 2004.²⁰ In Eastern and Southern Africa, the world's most affected region, AIDS-related deaths have decreased by 42% since 2010.²¹ Of those living with HIV in the region, 67% (13.8 million people) are now accessing treatment.²⁰

However, HIV remains a notable health concern among AYA in SSA. Studies in the region have shown that AYA are less likely than adults to enroll and remain in care after receiving an HIV diagnosis.^{2, 22, 23} AYA are also less likely than adults to adhere to their ART medication³ or achieve viral suppression.^{3, 23} Prioritizing HIV care and treatment among AYA in SSA is essential for achieving UNAIDS' 90-90-90 targets that include 90% of those on ART achieving viral suppression.²⁴

2.2 Violence against adolescents and young adults living with HIV in sub-Saharan Africa

The prevalence of violence against AYA is high in many settings across SSA. A systematic review published in 2016 found, for instance, that over 50% of adolescents ages 15-17 from 24 African countries had experienced physical violence, sexual violence, emotional violence, or bullying in the past year.⁵ These figures are of concern given the consequences of violence on young people's health in the short and long term. Youth

who experience violence show greater likelihood of depression,²⁵ substance use,^{25, 26} suicidal ideation,^{25, 27} and anti-social behavior²⁸ than those who do not experience violence. Violence has further been recognized as a human rights violation. Article 19 of the United Nations Convention on the Rights of the Child asserts children's rights to be protected from any form of violence, abuse, and neglect.²⁹

Despite the high prevalence of violence in SSA, researchers have only recently begun to estimate the prevalence of violence against AYA living with HIV. Five studies were identified—all published since 2016—which report on the prevalence of violence against adolescents and/or young adults in the following cross-sectional study populations: ages 10-19 in the Eastern Cape, South Africa (n=1,060);⁶ ages 13-19 in Johannesburg, South Africa (n=343);³⁰ ages 12-24 in Tanzania (n=182);³¹ ages 12-18 in Malawi (n=519);⁸ and ages 12-24 in Soweto, South Africa (n=129, females only).⁷ Prevalence figures vary, likely reflecting differences in violence definitions, timeframes of violence victimization, and ages of participants. Three studies looked at *bullying or peer violence*, with lifetime reports ranging from 11.6% in Malawi⁸ to 45.7% in the Eastern Cape⁶ to 70% in Johannesburg.³⁰ The two studies which examined past-year experiences of *violence in the home* found a similar prevalence: 15.1% in Malawi⁸ and nearly 20% in the Eastern Cape.⁶ Two studies looked at *sexual violence from any perpetrator*, observing that 1.6% in Tanzania³¹ and 5.2% of study participants in the Eastern Cape⁶ had ever experienced forced sex. One study looked at *intimate partner violence (IPV)*, finding that 33% of female youth had ever experienced physical or sexual partner violence.⁷ The study in the Eastern Cape also examined *violence from other perpetrator types*, finding that, in the past year, 45.3% had experienced physical violence

in the community, 41.2% had experienced physical violence from teachers, and 21.7% had experienced verbal abuse in the clinic.⁶ Prevalence figures in the studies which included male and female youth^{6, 8, 30, 31} were not disaggregated by sex.

2.3 Violence victimization and HIV outcomes

In addition to gaps in the literature on prevalence of violence, there is a paucity of data documenting how experiences of violence affect HIV outcomes, including VL failure, among AYA living with HIV in SSA. However, numerous studies among adult women living with HIV in the region and elsewhere have documented negative impacts of violence victimization—specifically from intimate partners—on engagement in care and virologic outcomes. Studies in Kenya and South Africa, for instance, demonstrated that women were less likely to access HIV care if they experienced or anticipated IPV.^{32, 33} Moreover, a 2015 systematic review and meta-analysis of 13 cross-sectional studies conducted primarily in the U.S. found significantly lower odds of ART adherence and VL suppression among victims of IPV who are living with HIV compared to non-victims.⁹ A recent analysis in the U.S. showed associations between IPV and a CD4 count of <200.¹⁰ The literature further demonstrates that violence victimization is associated with greater risk of psychological distress,³⁴ depression,³⁵ and alcohol use,³⁶ which are known barriers to medication adherence among adults.³⁷

Only three studies were identified which address this relationship among AYA in SSA, all of which found significant associations between experiences of violence and negative HIV outcomes.⁶⁻⁸ In a study conducted among 519 HIV-positive adolescents ages 12-18 in Malawi, those who had never witnessed household violence or experienced

violence (forced sex or physical violence) in the past year showed 60% lower odds of non-ART adherence in the past week compared to those who had witnessed/experienced such violence, adjusting for age and sex (adjusted odds ratio (aOR): 0.39, 95%CI: 0.24-0.65, $p<0.001$). The study also found that those who had never been bullied for taking medicines showed almost 50% lower odds of non-ART adherence in the past week compared to those who had been bullied (aOR: 0.53, 95%CI: 0.30-0.93, $p<0.05$). An association was not observed between experience of being bullied for one's physical appearance and non-ART adherence.⁸ In a study conducted among 129 HIV-positive young women (aged 13-24 years) in South Africa, those who had experienced physical or sexual IPV in the past year were over five times more likely to have skipped at least one ART pill in the past week, compared to those who had not experienced past-year IPV, adjusted for age (aOR: 5.37, 95%CI: 1.37-21.90, $p<0.05$).⁷

The most recent study, conducted among 1,060 adolescents ages 10-19 years in the Eastern Cape, South Africa, found significant associations between ART non-adherence and physical abuse from caregivers (aOR: 1.49, CI: 1.18-2.05, $p=0.015$), witnessing domestic violence at home (aOR: 1.80, CI: 1.22-2.66, $p=0.003$), physical violence from a teacher at school (aOR: 1.51, CI: 1.16-1.96, $p=0.002$), and verbal victimization from a clinic staff member (aOR: 2.15, CI: 1.59-2.93, $p<0.001$), adjusting for socio-economic, family, and HIV-related factors.⁶ This study additionally found significant increases in non-adherence with each additional violence victimization type.⁶ No differences in associations were observed according to the adolescent's sex.⁶ Although this study did not examine experiences of IPV, it has made a valuable contribution to the literature by showing independent associations between violence and

ART non-adherence, while also demonstrating the value of considering cumulative experiences of multiple forms of violence.

2.4 The unique developmental stage of adolescence

The lack of robust literature exploring the relationship between violence and HIV outcomes among AYA as compared to adults is concerning given their unique developmental stage. AYA are undergoing a period of cognitive development characterized by distinct patterns of neural activity.¹⁴ Brain activity is most active during late adolescence (15-19 years), when the prefrontal cortex is developing and brain networks become increasingly connected. The prefrontal cortex and associated regulatory functions typically mature during young adulthood (20-24 years).¹⁷ These neural changes occurring can limit youths' ability to override reflexive and habitual reactions, making them vulnerable to impulsivity and risky behavior.¹⁴ Young people are also still developing their advanced reasoning skills and the capacity to think about their feelings,¹⁵ which can make them vulnerable to concerns about other people's opinions—especially those of their peers.³⁸

Beyond the changes associated with cognitive development, AYA experience psychosocial, emotional, and social developmental changes,^{15, 17} which vary across cultures.³⁹ AYA may experience a diversity of transitions which could occur at notably different times. They may acquire increasing roles and responsibilities in the home, begin to make their own decisions about their health, become employed, or enter or leave school.⁴⁰ For many AYA, adolescence marks the beginning of sexual activity, which can bring new challenges. SSA, for instance, has the highest rates of adolescent pregnancy

and contraceptive use compared to other world regions.⁴¹ Female AYA who acquire older partners may interpret pushing, hitting, and verbal threats as a sign of love and a deeper commitment to the relationship.⁴² Adolescent marriage is a concern for millions of adolescent girls in the region.⁴⁰ These distinct and varied circumstances, coupled with cognitive changes AYA are undergoing, reinforce the need for a youth-centered approach to assessing experiences of violence victimization as they relate to HIV outcomes.

2.5 Study setting

Country context

Zambia is a land-locked, lower middle-income country in Southern Africa with a population of 16 million (Figure 1).⁴³ The population is generally young (46% are below age 15) and represents over 70 ethnic groups. English is the official language, but more than 16 primarily Bantu languages are spoken across the country's 10 provinces. Three-quarters of the population is Protestant. Although Zambia had one of the world's fastest growing economies from 2004-2014 (about 6.7% annual GDP growth), the country is vulnerable to fluctuations in the global commodities market due to its dependence on the copper-mining industry; in 2015, Zambia was overtaken by the Democratic Republic of Congo as the largest producer of copper in Africa.⁴³

The country has struggled with high rates of morbidity and mortality, with a life expectancy of 52.7 years.⁴³ Other challenges include its high unemployment rate (15%), high fertility rate (5.58 children born per woman), and low literacy rate (63%).⁴³ Over half of the population (8.8 million) is living in moderate poverty, defined as falling below the national poverty line set at 214 Zambian Kwacha per month (about 15 US\$).⁴⁴

Zambia is reported to have 1,956 health facilities, 88% of which are government-owned.⁴⁵ The Ministry of Health manages the health system, with support from Provincial and District Health management teams.

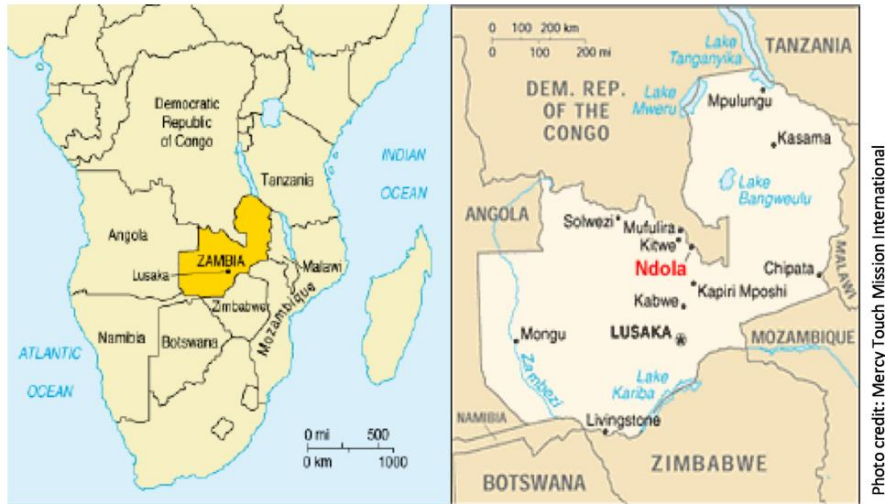


Figure 1. Location of Zambia in sub-Saharan Africa (left) and Ndola, the study site (right)

This study was carried out in Ndola, which is the capital of the Copperbelt Province. Ndola is a peri-urban community with a population of about 370,000,⁴⁶ located near the Democratic Republic of Congo border in North-Central Zambia (Figure 1). It is the commercial center of the Copperbelt Province, named for the country's prominent copper-mining industry. The Province at one time fueled the economy of Northern Rhodesia under British colonial rule. After English, Bemba is the language most commonly spoken.⁴⁶ In 2012, the Copperbelt held the third-largest number of health facilities (n=250) of the 10 provinces in Zambia.⁴⁵ The HIV prevalence in the Copperbelt Province among adults, ages 15-59 years, was 13.8 percent (95%CI: 12.3-15.3) in 2016, representing the third-highest of all of Zambia's provinces.¹³

HIV and violence among adolescents and young adults in Zambia

Zambia's adult HIV-prevalence is among the highest in the world at 11.3%.⁴⁷ The government has taken notable steps to address HIV. It increased its treatment coverage by more than 25% from 2010-2015 and has progressed toward achieving UNAIDS' 90-90-90 targets: as of 2018, among people living with HIV, 87% knew their status, 78% were on treatment, and 58% were virally suppressed.⁴⁷ In 2016, the Ministry of Health released guidelines recommending lifelong ART to all children, adolescents, and adults, regardless of CD4 cell count.⁴⁸ Yet, challenges remain in addressing HIV among Zambian AYA. Less than half of youth ages 15-24 know their HIV status.⁴⁹ The prevalence of viral suppression is 33.6% among female and 36.7% among male AYA, aged 15-24 years; in contrast, almost three-quarters of adults, ages 45-49, achieve viral suppression.⁴⁹ There are also notable disparities in HIV outcomes according to sex. HIV prevalence, for instance, is 5.7% among female compared to 1.8% among male AYA, aged 15-24 years.⁵⁰

The prevalence of violence victimization among AYA is also high in Zambia. Based on the 2013-14 Demographic and Health Surveys (DHS), 30-40% of young women ages 15-24 have ever experienced physical violence; and 8-16% have ever experienced sexual violence (data not collected from young men).¹¹ Moreover, the 2014 Zambian Violence against Children Survey (VACS) found that 43% of female and 34% of male adolescents ages 13-17 have experienced past-year physical, emotional, or sexual violence.¹² Only one study was identified which measured experiences of violence against AYA living with HIV. Using data from the Copperbelt Province, the cross-sectional analysis found that, of 64 youth who had ever had sex, over one third of males

(9/29, 31%) and two-thirds of females (22/35, 63%) indicated that they were forced against their will the first time they had sex.⁵¹ In analyses adjusted for age and sex, no association was found between experience of coerced first sex and having a ≥ 48 -hour treatment gap in ART adherence in the past three months, but the sample size was small.⁵² No other studies were identified on experiences of violence or the links between exposure to violence and HIV outcomes among AYA in Zambia.

2.6 Study significance

This study will play a critical role in deepening our understanding of violence victimization as it relates to HIV outcomes among AYA living with HIV in Zambia. Our research expands in several ways on the limited number of previous studies that have assessed the relationship between violence and HIV outcomes among young people in SSA.⁶⁻⁸ For example, this study uses VL failure as a primary outcome measure, in contrast with previous studies that have relied on ART adherence, which is prone to social desirability and recall bias.⁵³ This study also includes young adults in addition to adolescents (the target population of existing studies) and uses a mixed methods approach, integrating qualitative methods to further understand *how* violence relates to HIV outcomes. Importantly, this study also goes beyond the use of single measures of violence addressing one or two forms of violence to examine violence victimization in detail, including the type and perpetrator of violence and the severity and frequency of the violence. Study findings will inform future HIV and anti-violence interventions, policies, and research, both in Zambia and regionally.

Chapter 3. Methods

3.1 Study design and overview of methods

A cross-sectional explanatory, sequential mixed methods study⁵⁴ was conducted, comprised of two phases: a quantitative data analysis phase followed by qualitative phase. In the first phase, quantitative analyses for Aims 1 and 2 were conducted using baseline survey and VL data from 272 AYA enrolled in the Project YES! (Youth Engaging for Success) RCT. Phase I provided information about the burden of violence victimization and its association with VL failure. Findings from these analyses informed the design of qualitative IDI guides for the second phase (Aim 3). Phase II offered more nuanced insight into experiences of violence victimization and how these experiences intersect with HIV outcomes within a subset of 41 trial participants. Table 1 summarizes the study's aims, research questions, and methods.

In Chapter 7, findings from Aim 3 are interpreted in combination with findings from Aims 1 and 2 through between-method data triangulation.⁵⁵ During this process, quantitative and qualitative methods were equally valued, and both consistencies and inconsistencies across the methods identified. The goal was for completeness,⁵⁵ whereby the possibility of multiple realities was recognized in an effort to generate a holistic understanding.

Recruitment, sampling, data collection, and analysis procedures are described within the Methods sections of Chapters 4, 5, and 6. This chapter explains how the dissertation research was carried out under the umbrella of a parent study, describes the

study population, presents the study's theoretical orientation and conceptual framework, and finishes with a description of the ethical considerations which informed our research.

Table 1. Overview of Study Aims, Research Questions, and Methods

Aims	Research Questions	Methods
Aim 1: Estimate the prevalence and identify perpetrators of violence against adolescents and young adults (AYA) living with HIV in Zambia.	(1) What is the prevalence of lifetime and past-year physical violence, psychological abuse, and sexual violence victimization among AYA? (2) Who perpetrates past-year physical violence, psychological abuse, and sexual violence against AYA? (3) How do the prevalence and perpetrators of violence differ according to the youth's sex and age group (15-19 vs. 20-24 years)?	Analyses of baseline data from 272 AYA enrolled in the Project YES! (Youth Engaging for Success) trial. Summary statistics, including weighted percentages and 95% confidence intervals, and Venn diagrams generated.
Aim 2: Assess associations between past-year violence victimization and viral load failure among AYA living with HIV in Ndola, Zambia.	(1) What is the association between any past-year violence victimization and VL failure among AYA living with HIV, accounting for experiences of any violence, the type of violence, the perpetrator of violence, and polyvictimization? (2) How do any associations observed vary according to the youth's sex and age group (15-19 vs. 20-24 years)?	Analyses of baseline data from 272 AYA enrolled in the Project YES! trial. Univariable and multivariable logistic regression used to derive associations. Interaction terms incorporated to look at differences in associations by sex and age group.
Aim 3: Explore the intersection between experiences of violence and HIV outcomes among AYA living with HIV in Ndola, Zambia.	(1) In what ways do youths' experiences of violence victimization affect their HIV outcomes, including their engagement in care, ART adherence, and self-described virologic results?	Semi-structured in-depth interviews with 41 AYA enrolled in Project YES!, purposively selected to achieve variation in their experiences of violence victimization, VL, sex, and age. Data analyzed using inductive and deductive thematic content analysis.

3.2 Project YES! (Youth Engaging for Success)

This dissertation research was nested within the Project YES! (Youth Engaging for Success) RCT. The trial assessed the impact of a peer-mentoring program on viral

suppression, ART adherence treatment gaps, and self-stigma. AYA were consecutively enrolled from across four facilities: Arthur Davison Children's Hospital (ADCH), Ndola Teaching Hospital (NTH), and two primary care clinics (PCC) – Twapia Clinic and Lubuto Clinic. The participating facilities were purposively selected for the parent study because they represent different models of care. ADCH is a 250-bed hospital for children and has a clinic that serves adolescents and young adults living with HIV who should ultimately make a physical transition to adult HIV care. In contrast, NTH and the two PCCs are essentially adult HIV care settings. While they were not designed to initially serve HIV-positive adolescents, they continue to experience a growth in the number of enrolled adolescents. The PCCs were purposively selected based on their high HIV-positive adolescent patient populations, designated ART center status, and proximity to the other study sites.

After completion of the initial 6-month intervention and assessment, the primary intervention group entered a less intensive maintenance phase and the comparison group received the 6-month intervention. Assessments, including a survey and a blood draw for VL testing, occurred at baseline, at the end of the first six months, and at the end of 12 months. This dissertation drew only on the baseline data collected. Questions about experiences of violence were integrated into the baseline surveys for the purposes of this dissertation (Aims 1 and 2, see Appendix 9.1.1). Survey data were collected using Magpi software on tablet computers. Additional qualitative data collection (Aim 3) was planned after baseline data collection had occurred, during the maintenance phase for the intervention group and intervention delivery for the comparison group (see Appendix 9.1.2 for IDI guide).

3.3 Study population

Aims 1 and 2 used baseline survey data collected from 272 Project YES! trial participants, enrolled across the four participating study clinics. The inclusion criteria for the parent study, and as a result for inclusion in the Aims 1 and 2 analyses, were as follows:

- Age 15-24 years;
- Diagnosed as HIV-positive;
- Aware of his/her HIV status;
- On ART for at least 6 months;
- A speaker of Bemba or English;
- Not planning to move out of the district in the next 18 months;
- Willing and able to give informed verbal consent to participate; and,
- Planning to be available to attend study activities over the next 18 months, as needed.

Participants were excluded from the parent study (and hence Aim 1 and 2 analyses) if they were too sick to participate, currently attending boarding school, had a sibling already enrolled in the study, or had participated in the NIH-funded R34 Positive Connections intervention in Ndola (4/30/2016-12/30/2017, NIH number 5 R34MH105264 02).

Participants for Aim 3 IDIs were a subset of trial participants included in the Aims 1 and 2 analyses. Inclusion criteria for the qualitative Aim 3 were as follows:

- Enrolled as a participant in the parent Project YES! trial;
- Agreed to be contacted for future studies on the parent study informed consent/assent form; and,
- Willing and able to give informed verbal consent to participate.

We recruited 41 participants for IDIs using maximum variation sampling. This purposive sampling strategy is useful when seeking shared patterns across participants based on heterogeneity in the sample.⁵⁶ We sought variation in the experiences of violence

(moderate and severe), viral load at baseline (failure and not), sex (male and female), and age group (15-19 and 20-24 years). Recognizing that achieving an adequate sample size in qualitative research is relative and serves as a challenge within purposive sampling strategies,⁵⁷ we sought where possible to include at least five participants from each sub-grouping in line with minimum sample size recommendations from Kuzel.⁵⁸

Table 2 presents a summary of the characteristics of AYA interviewees used for maximum variation sampling. Violence measures were adapted from the International Society for the Prevention of Child Abuse and Neglect Screening Tool-Child Instrument (ICAST-C)⁵⁹ and the WHO Multi-Country Study on Women's Health and Domestic Violence (WHO MSC).¹⁹ Drawing on lifetime measures of violence and using WHO classifications for the severity level of physical violence,¹⁹ we grouped participants as having experienced moderate violence if reporting one or more act of moderate physical violence or psychological abuse, and severe violence if reporting one or more act of severe physical violence or forced sex, on baseline surveys. We grouped participants as having VL failure if their baseline test showed $\geq 1,000$ copies of HIV-RNA/mL,^{60, 61} based on the Qiagene QiAmp viral RNA mini kit (QIAGEN, Germany). For experiences of violence, we prioritized recruiting a slightly higher proportion of AYA who had experienced severe as compared to moderate violence, which we anticipated would offer more insight into the relationship with viral load.

Table 2. Maximum variation sampling of 41 participants for in-depth interviews

	Viral load failure (n=21 participants)	Non-viral load failure (n=20 participants)
Moderate violence		
Total	8	8
Male	4	3
Female	4	5
Ages 15-19	5	4
Ages 20-24	3	4
Severe violence		
Total	13	12
Male	6	4
Female	7	8
Ages 15-19	6	4
Ages 20-24	7	8

3.4 Theoretical orientation and conceptual framework

This research was carried out using a constructivist approach, recognizing that knowledge is co-constructed through interactions between the researcher, the research subject, and the setting.⁶² Throughout the study, the research team considered how their identities and backgrounds were shaping the data collected.⁵⁵ Data were collected by Zambian researchers and for Aim 3, interviewers were matched with participants by sex to help participants feel more comfortable discussing sensitive topics. The research team spoke openly about personal experiences of and cultural viewpoints on violence and discipline during trainings and, in Aim 3, during debriefing sessions and data interpretation meetings. These conversations helped the researchers avoid imposing their perspectives of what constitutes violence during data collection or interpretation.

This study was also grounded in a socio-ecological framework. In contrast with models which focus on personal characteristics that influence health and behavior, socio-ecological approaches recognize that behaviors are a reflection of a complex interplay

between factors across multiple levels. Building on socio-ecological models dating back to the 1970s,^{63, 64} researchers have advocated for the use of socio-ecological frameworks in studies of violence⁶⁵ and HIV^{66, 67} – both for developing a deeper understanding of these multi-faceted health issues and for designing appropriate interventions. Socio-ecological frameworks have been deemed especially valuable for understanding factors affecting the health decisions made by people dealing with highly-stigmatized issues, such as violence and HIV, since stigma itself can serve as a strong influence on behavior.^{68, 69}

We took a socio-ecological approach in recognizing that experiences of violence and HIV outcomes among AYA are shaped by multiple spheres of influence. Within the HIV field, Kaufman et al. present a refined socio-ecological model showing factors which influence HIV-related behavior at the individual, interpersonal, community, institutional, and structural levels.⁶⁶ The Kaufman model was developed based on a review of the literature on HIV prevention, treatment, and care behavior-change interventions. Drawing on the recommendations of Kaufman et al, our conceptual framework centered on the individual, interpersonal, community, and institutional levels (Figure 2).

Aims 1 and 2 addressed the individual and interpersonal levels. At the individual level, we examined AYA experiences of violence victimization (Aim 1) and the relationship between these experiences and VL failure (Aim 2). Our model incorporated individual-level factors which we hypothesized to be potential confounders and effect modifiers of the association between violence victimization and VL failure (Figure 2). At the interpersonal level, we examined the perpetrators of violence against AYA.

Specifically, we incorporated quantitative measures assessing violence victimization from multiple perpetrator groups, including a romantic partner, parent/caregiver, other family member, friend/peer, stranger, healthcare worker, neighbor, religious leader, military/police, school staff member, employer, and healthcare worker.

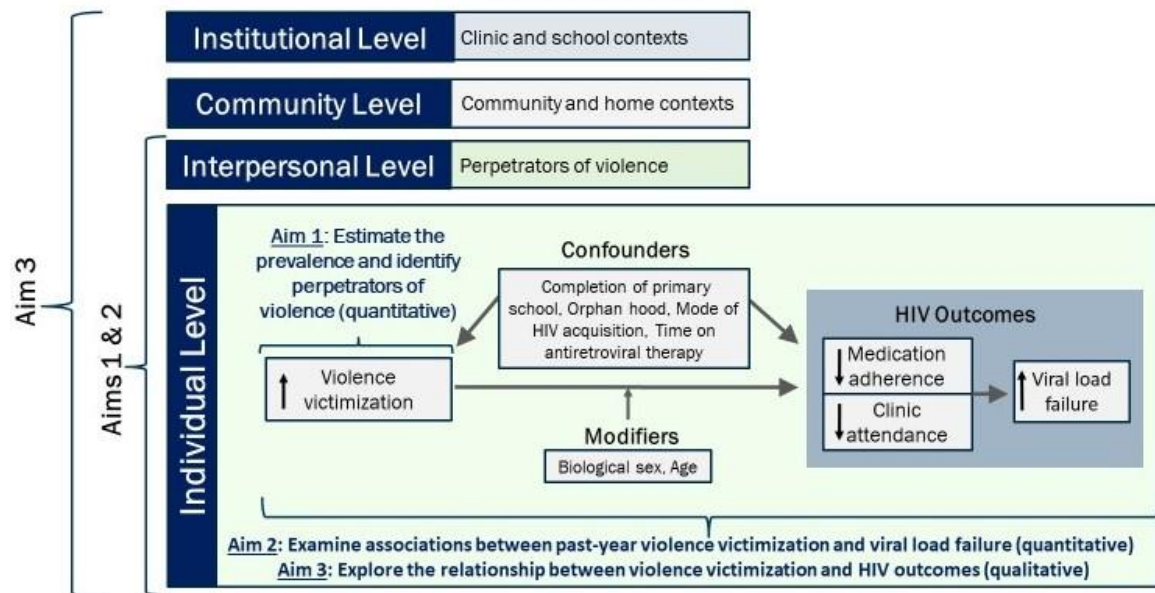


Figure 2. Conceptual framework for the association between violence victimization and viral load failure among adolescents and young adults living with HIV in Zambia

Building on Aims 1 and 2, we considered all four levels of the model during Aim 3 IDIs. At the individual level, we explored the relationship between AYA experiences of violence and their HIV outcomes, including their medication adherence and clinic attendance in addition to virologic results. At the interpersonal level, we sought to better understand the perpetrators of violence identified during Aims 1 and 2. For instance, we explored more deeply whom the family members who perpetrate violence consisted of beyond the parent/caregiver. The qualitative methods used in Aim 3 also allowed us to gain insight into the community- and institutional-level contexts that influence AYA experiences of violence and HIV outcomes. Within the community level, we sought to

better understand the home environments of AYA, including their living situations and relationships with other members of the household. We probed into how the AYA manage their HIV while at home, which household members are aware of their HIV status, and their experiences of violence within the home. We also asked about the communities in which they live, including the forms of violence which are typically considered acceptable and how their community members respond to experiences of violence. At the institutional level, we asked about AYA experiences accessing HIV treatment within clinics. We additionally explored their experiences and discipline practices at school, including their relationships with their peers and teachers.

While our framework did not include the structural level, we recognized the importance of this level to this research and considered it in our interpretation of the study results and development of study implications (Chapters 7 and 8).

3.5 Ethical considerations

Ethical approval

Ethical approval for this dissertation research was obtained from the ethical review boards at Eres Converge in Zambia and the Johns Hopkins Bloomberg School of Public Health. Additionally, the Zambian Ministry of Health through the National Health Research Authority reviewed and approved the research.

Informed consent

Prior to engaging in any study activities, all participants gave informed consent or assent. The parent study consent/assent form provided information about and an opportunity to consent to the trial data collection and an IDI. Only participants who

consented to an IDI were invited for Aim 3 data collection. Prior to the start of the IDI, these participants were reminded of their consent and their ability to opt out.

According to the 2013 *Zambian Health Services Research Act (Act 2)*,⁷⁰ while participants ages 18-24 years were able to provide their own written consent, parental consent was required for minors under age 18 years. Our study team therefore required parental/caregiver adult consent for all participants ages 15-17. Once a 15-17-year-old expressed interest in the study, a staff member from the parent study worked with the adolescent to identify the caregiver who would provide consent for their participation. Contact with a parent/caregiver was only made with the explicit consent of the participant. Participants ages 15-17 additionally provided written informed assent.

Special considerations for violence research

This study aligned with WHO best practice for violence research provided in its *Ethical and Safety Recommendations for Research on Domestic Violence against Women*,⁷¹ whose principles extend broadly to research on violence victimization. Special attention was paid to the following areas:

Staff recruitment and training

WHO guidelines note all research team members should be carefully selected and receive specialized training and support in violence research.⁷¹ Effort was therefore made to recruit staff who had previous research experience with the target population. Prior to baseline data collection, research assistants (RAs) were sensitized on background information on violence against AYA, the goals of the dissertation research, and strategies for sensitive interviewing techniques (e.g. when a participant appears

uncomfortable). Qualitative interviewers underwent extensive training on the above topics and were given an additional opportunity to reflect on their own biases and stereotypes about violence victimization.⁷¹ Throughout qualitative data collection, individual and collective debriefing meetings allowed the interviewers to discuss what they were hearing and how was affecting them to reduce the stress of the fieldwork.⁷¹

Confidentiality

WHO guidelines highlight that protecting confidentiality is essential to ensuring both respondents' safety and data quality, given the extremely personal nature of violent experiences.⁷¹ Surveys and IDIs were thus carried out in private spaces at the clinic where the participant felt comfortable. Quantitative data (Aims 1 and 2) were collected on pass-word protected tablet computers, and data were verified and stored on secure servers. Transcripts for Aim 3 were anonymized, and informed consent/assent forms stored separately from data with study identification numbers.

Minimizing under-reporting of violence

According to WHO guidelines, studies assessing the prevalence of violence must be methodologically sound to avoid notable under-reporting of violence.⁷¹ To minimize under-reporting during survey administration, surveys incorporated 17 measures of lifetime and past-year experiences of violence which asked about behaviorally-specific acts, and the perpetrators of these acts, in the past year. Violence questions were preceded by less sensitive topics and placed at the end of the baseline survey, after the RA had established a rapport with the participant.¹⁹ Prior to the questions about violence, RAs read all participants the following text:

Young men and women all over the world may experience violence from strangers but also from people they know well, such as a romantic partner, teacher, or family member. We are not referring to things that might happen when you are playing or having fun with your peers. The next questions are personal and could be uncomfortable to answer. Remember that you can skip any questions that you would prefer not to answer. The questions will include things that can happen to young men and women from a range of people, including a romantic partner. By romantic partner, I mean a boyfriend or girlfriend, fiancé, or husband or wife.

This text was designed to help the participant feel comfortable disclosing his/her experiences of victimization and avoid interpreting the violence questions as judgmental, blaming, or stigmatizing.⁷¹

Safety planning

WHO guidelines highlight the safety of respondents and researchers as paramount. Fieldworkers should be trained to refer respondents to available local services. Violence questions should only be incorporated into surveys designed for other purposes when ethical and safety requirements can be met.⁷¹

This study prioritized participants' safety through both the informed consent process and the creation of a referral safety protocol. First, in line with WHO recommendations,⁷¹ the qualitative sub-study was not framed in consent forms as addressing experiences of violence victimization. This was intended to protect minors (ages 15-17 years) who might be victims of violence from their parent or caregiver, in cases where the parent/caregiver must consent to the child's participation in the study. However, AYA themselves must be fully informed about the nature of the questions prior to participating.⁷¹ AYA were therefore told that they were being invited for an IDI based on their experiences of violence victimization reported on the parent study baseline survey during the reminder of consent/assent. Additionally, over the course of the IDI,

the interviewer carefully introduced any sections enquiring about violence, forewarning the participant about the questions and allowing him/her to stop the interview or not answer the questions.⁷¹ All AYA interviewees were given the option of meeting with a healthcare provider about their experiences.

Second, our study team created a referral safety protocol for the parent study, which was also followed during Aim 3 data collection. Study staff referred AYA to designated clinic staff if they had concerns about a participant's wellbeing or if participants reported the following on surveys: a) any experience of severe physical violence in the past year; b) any experience of sexual violence ever, or c) thoughts of ending one's life in the past week (Table 3).

Table 3. Measures of experiences requiring automatic referral of participants

Type of measure	Questionnaire items*
Severe physical violence	Has anyone in the past year...1) Kicked you, dragged you, or severely beaten you up? 2) Choked you or burnt you on purpose? 3) Threatened to use or actually used a sharp object or other weapon against you?
Sexual violence	Has anyone ever...1) Made you watch a sex video or look at sexual pictures? 2) Made you look at their private parts or wanted to look at yours; 3) Touched your private parts in a sexual way, or made you touch theirs; 4) Physically forced you to have sexual intercourse when you did not want to?
Suicidal thoughts	In the past week, have you had thoughts about ending your life?

*Measures derived from the WHO Multi-Country Study on Women's Health and Domestic Violence,¹⁹ the IPSCAN Child Abuse Screening Tool-Child Instrument,⁵⁹ and the Hopkins Symptoms Checklist depression subscale-15.⁷²

Definitions of severe physical and sexual violence were drawn from the WHO MCS¹⁹ and the ICAST-C⁵⁹; the definition for suicidal ideation was based on one item from the Hopkins Symptoms Checklist depression subscale-15⁷² (Table 3). Clinic staff responded according to clinical practice, local policy and Zambian law. Referral information was

tracked using referral forms and healthcare provider books. Referral procedures for study staff and youth peer mentors are depicted in Figure 3.

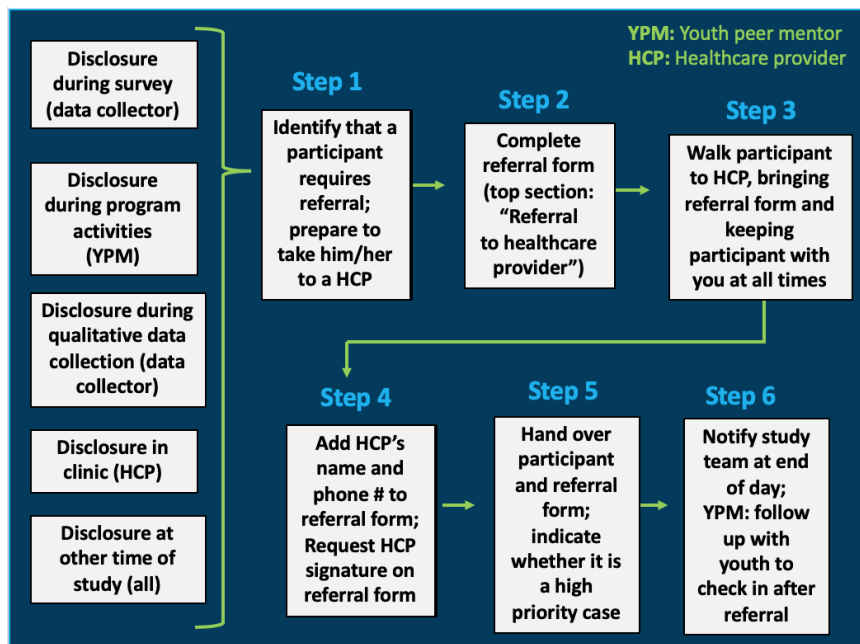


Figure 3. Procedures for study staff and youth peer mentors to follow in referring Project YES! participants to designated healthcare providers

Interpretation and distribution of findings

WHO guidelines emphasize the ethical responsibility of researchers to ensure that their findings are properly interpreted and used to advance policy and intervention development.⁷¹ We presented our results to key stakeholders in Zambia, including Ministry of Health and Education officials, researchers, community representatives, healthcare providers, and representatives from non-governmental organizations. Findings were also presented at international conferences in Rwanda and Chicago, Illinois. Feedback from these presentations informed our interpretation of findings. Where possible, we will seek to publish our findings in open-access peer-reviewed journals to increase accessibility to researchers in low-resource settings.

Chapter 4. Prevalence and perpetrators of violence against adolescents and adults living with HIV in Zambia

4.1 Abstract

Background: Little is known about violence victimization among HIV-positive adolescents and young adults (AYA) in sub-Saharan Africa. This analysis examines the prevalence and perpetrators of violence against AYA living with HIV, aged 15-24 years, in Zambia.

Methods: We analyzed baseline data among 272 AYA (60.1% female, 71.0% perinatally infected) from Project YES! (Youth Engaging for Success), a randomized controlled trial in four HIV clinics in Ndola, Zambia. Violence measures were adapted from the ICAST Child Abuse Screening Tool and the World Health Organization Multi-Country Study on Women's Health and Domestic Violence. We estimated lifetime and past-year prevalence of physical violence, psychological abuse, and forced sex, disaggregated by sex.

Estimates were weighted using age and sex data from the 2013-14 Zambian Demographic and Health Survey to be representative of HIV-positive AYA in Zambia. Past-year prevalence was measured for 12 perpetrator groups.

Results: The estimated lifetime prevalence of violence victimization was 78.2%. Past-year prevalence was 72.0% among males and 74.5% among females. Almost half of AYA (46.1%) had ever experienced polyvictimization (2+ types of violence).

Psychological abuse was most common (70.4% lifetime, 65.3% past-year), followed by physical violence (50.8% lifetime, 44.7% past-year) and forced sex (10.4% lifetime, 4.7% past-year). Among past-year victims, males experienced more violence than

females from a friend/peer (74.3% vs. 45.1%, $p<0.001$); females experienced more violence than males from a romantic partner (33.3% vs. 5.0%, $p<0.001$), parent/caregiver (32.4% vs. 17.6%, $p<0.05$), and stranger (19.7% vs. 5.2%, $p<0.001$).

Conclusion: The widespread and overlapping prevalence of multiple types of violence highlights the critical need for prevention and response efforts that are tailored to youths' sex and the perpetrator group. Future research should explore violence victimization and HIV outcomes, and the measurement of psychological abuse and sexual violence, among HIV-positive AYA in the region.

4.2 Introduction

In many settings in sub-Saharan Africa (SSA), adolescents and young adults (AYA) face high levels of violence victimization. A systematic review found that over 50% of adolescents (aged 15-17 years) from 24 African countries had experienced physical, sexual, or emotional violence, or bullying, in the past year.⁵ In a meta-analysis, roughly one-third to one-half of young women (aged 20-24 years) reported having ever experienced physical or sexual intimate partner violence (IPV) across 8 countries in Eastern or Southern Africa.⁴ Young people who are exposed to violence in home, school, and community settings are at risk of negative health outcomes in the short- and long-term, including greater likelihood of depression,²⁵ substance use,^{25, 26} suicidal ideation,^{25, 27} and anti-social behavior.²⁸

Studies have identified IPV as an important concern among HIV-positive adult women in SSA.^{73, 74} These studies demonstrate that experiencing violence can disrupt antiretroviral therapy (ART) adherence and prevent viral suppression.⁹ Moreover, for

adult women, violence or the fear of violence—particularly from intimate partners—has been associated with increased sexual risk behavior⁷⁵ and HIV non-disclosure,⁷⁶ additional barriers to the prevention of HIV transmission.

However, comparatively little attention has been paid to violence from any perpetrator against AYA living with HIV in the region. SSA is home to the majority of the world's HIV-positive youth (84%, 1.7 million),¹ and three in four new HIV infections among 15-19-year-olds occur in SSA.⁷⁷ Some studies—for example, in Tanzania,³¹ South Africa,^{30, 78} and Malawi⁸—have assessed exposure to violence among HIV-positive youth as an independent or adjustment variable, reporting ranging prevalence figures derived from widely varying measures and methodologies. Only one study was identified for which violence was the primary focus in a population of HIV-positive adolescents in SSA; this study by Cluver et al. found that between 41% and 47% of the sample of 1,060 South African boys and girls (ages 10-19) reported exposure to past-year physical or verbal violence from teachers, peers, or community members⁶ but did not measure IPV. While there is limited data on HIV-positive adolescents, there is virtually no information available on HIV-positive young men and violence victimization in SSA, especially outside of South Africa. This paucity of data is concerning since the needs of AYA, who are undergoing cognitive, psychosocial, emotional, and social changes,¹⁵ often differ from those of adults. It is critical to ascertain the magnitude and identify key perpetrators of violence against HIV-positive youth in SSA to inform the development of appropriate prevention and response efforts. Such efforts could impede the negative health and developmental consequences of violence, and also prevent HIV disease progression and reduce the onward transmission of HIV.

Understanding the epidemiology of violence against both male and female AYA living with HIV is particularly needed in Zambia, which has among the highest prevalence of both HIV (12% among adults⁷⁹) and partner violence (47% among ever-married women¹¹) globally. Failure to recognize the role of violence in the lives of HIV-positive AYA could ultimately hamper global efforts to end the AIDS epidemic by 2030.⁸⁰ To address this gap, the current study describes the prevalence and perpetrators of physical violence, psychological abuse, and sexual violence against AYA living with HIV in Zambia.

4.3 Materials and methods

Design and procedures

We conducted a cross-sectional analysis using baseline data from the Project YES! (Youth Engaging for Success) randomized controlled trial (RCT). The trial was designed to assess the impact of a peer mentoring intervention on viral load and other HIV-related outcomes among AYA living with HIV in Ndola, Zambia. Baseline data were collected from December 2017 through May 2018 in four HIV clinics, including a children's hospital, an adult hospital, and two primary health facilities. AYA were consecutively recruited if they met the following eligibility criteria: aged 15-24 years, spoke English or Bemba, were aware of one's HIV status, on ART for at least six months, and available for study activities over 18 months. AYA were ineligible if they were too sick to participate, attending boarding school, had a sibling already enrolled in the study, or had participated in a recent adolescent/caregiver intervention study held at two of the study clinics.

Patients identified as potentially eligible were approached by a health care provider (HCP) and referred, if interested, to a trained research staff member to undergo the informed consent process. In line with Zambian law, written parental/caregiver consent and youth assent was required for participants aged 15-17 years.⁷⁰ Research staff members administered baseline surveys to all consenting and assenting youth participants, in either Bemba or English, during face-to-face interviews using Magpi software on tablet computers. Given that baseline surveys included questions about experiences of violence and suicide ideation, in addition to the potential for sensitive issues to arise during peer mentoring meetings, the team developed and implemented a safety protocol with referral procedures for both peer mentors and data collectors to connect youth participants with HCPs for additional care (see further description under Ethics). Data were uploaded to a secure server and checked for quality. Additionally, data were collected from participants' medical charts, including ART start date.

Measures

Self-reported measures of violence victimization were adapted from the internationally-recognized and widely-used the International Society for the Prevention of Child Abuse and Neglect Screening Tool-Child Instrument (ICAST-C)⁵⁹ and the World Health Organization Multi-Country Study on Women's Health and Domestic Violence against Women (WHO MCS).¹⁹ The ICAST-C is shown to have good internal consistency and construct validity⁸¹ and has been administered in numerous settings in SSA, including Mali, Uganda, and Zambia.⁸² Given that the ICAST was designed for children ages 11 to 18, it was supplemented by items from the WHO MCS, which has been widely used to measure violence from intimate partners across the region. The

WHO MCS items are similar to those items used to assess violence in the 2013-14 Zambia Demographic and Health Survey (DHS).¹¹

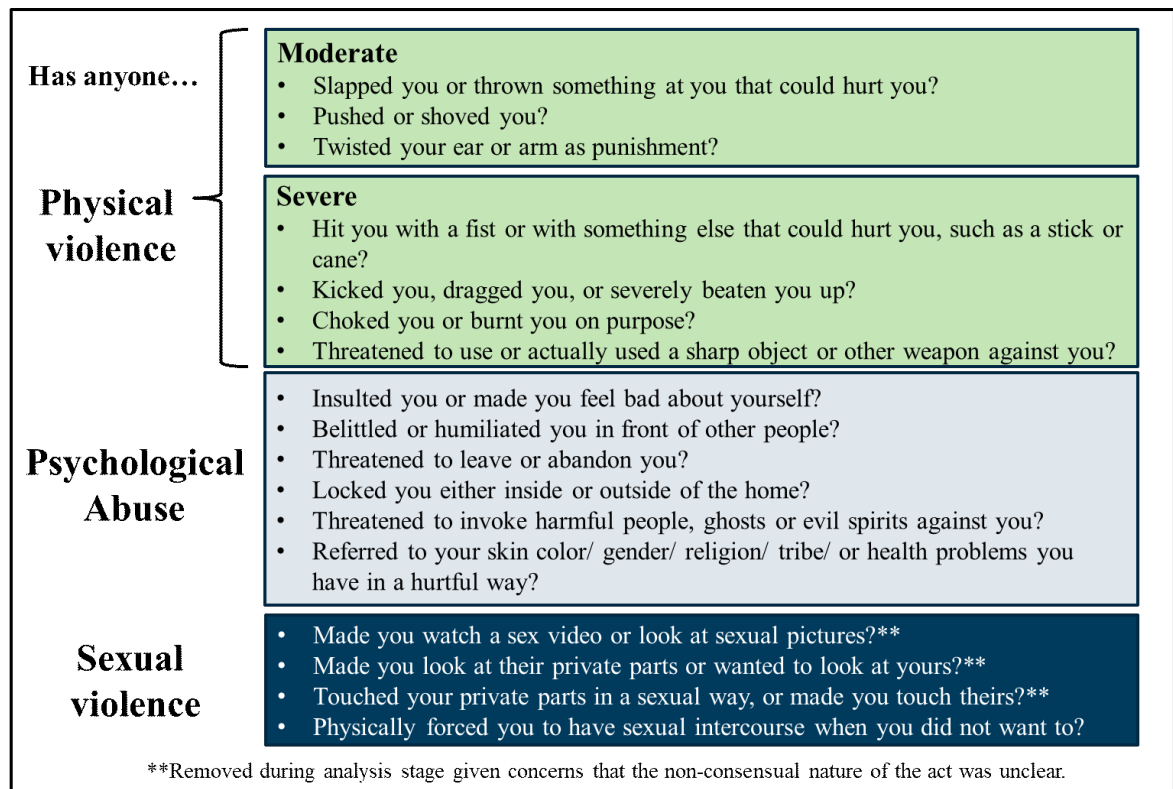


Figure 4. Measures of violence victimization, derived from the ICAST-C Child Abuse Screening Tool and the WHO Multi-Country Study on Women’s Health and Domestic Violence

Survey questions included the following forms of violence victimization, ever and in the past year: physical (7 items), psychological (6 items), and sexual (4 items) (Figure 4). Experiences of physical violence were distinguished by severity level based on WHO guidelines,¹⁹ with three items capturing ‘moderate’ violence and four items ‘severe’ violence. For past-year measures, participants could choose from a range of 12 possible perpetrator groups: romantic partner, parent/caregiver, other family member, friend or peer, stranger, school staff member, employer, health care worker, neighbor, religious leader, military/police, or someone else the youth knows. For sexual violence measures,

the age at which the first experience occurred was measured. Survey items were reviewed by Zambian coauthors to ensure their appropriateness. The full instrument was translated into Bemba and pilot-tested among youth in Ndola for comprehension and clarity.

Socio-demographic characteristics measured in the baseline survey included the youth's age, sex, completion of primary school, current employment status, marital status, and orphanhood status. HIV measures included self-reported mode of HIV acquisition and length of time on ART.

Analyses

Study participants were classified as having experienced physical violence, psychological abuse, or sexual violence victimization if they reported one or more of these acts of violence victimization either ever (lifetime) or in the past year. Participants were classified as having experienced polyvictimization if they reported two or more types of victimization (physical, psychological, or sexual), ever or in the past year. Sexual violence was operationalized by the answer to one question of forced sex from the WHO MCS. The remaining three items from the ICAST described sexual behaviors that might be considered consensual if between older youth who were intimate partners.

We also conducted a sensitivity analysis to estimate the prevalence of past-year psychological abuse using a more conservative definition in which participants were classified as victims if they reported experiencing two or more acts of psychological abuse from at least one type of perpetrator in the past year. While a common threshold for physical or sexual violence is one or more acts of violence, researchers have questioned whether this same threshold should apply for psychological abuse, which has more variation in form and acceptability across cultures.⁸³ A single act of being insulted,

for instance, is thought by many to be too low a threshold to constitute psychological abuse.⁸⁴ This sensitivity analysis thus sought to assess whether using a stricter definition of psychological abuse would affect the research results.

Descriptive analyses were conducted to observe distributions of study variables. Lifetime and past-year prevalence of physical violence, psychological abuse (using both definitions), and forced sex was estimated using weighted percentages and 95% confidence intervals. Prevalence figures were disaggregated by youths' sex and age group, and differences in proportions were assessed using F tests to accommodate the sampling design. Past-year prevalence was summarized according to perpetrator groups, using only the primary (less conservative) definition for psychological abuse (i.e. one experience or more). Venn diagrams were generated to visually depict respondents' overlapping experiences of physical violence, psychological abuse, and/or forced sex victimization in their lifetimes and in the past year. Analyses were carried out using STATA 14.⁸⁵

Prevalence figures were weighted for age (15-19 and 20-24 years) and sex (male and female) using the Zambian 2013-14 DHS¹¹ such that estimates would be representative of HIV-positive males and females, ages 15-24 years in Zambia. We used Zambia DHS data to derive the number and proportion of HIV-positive individuals within the following four categories: males ages 15-19 years; females ages 15-19 years; males ages 20-24 years; and females ages 20-24 years. We then divided the DHS proportion by the proportion in our sample to derive a weight for each of category that we subsequently applied to our population estimates. Table 4 details the process used to arrive at the sampling weights for this aim.

Table 4. Application of post-stratification weights, using the 2013-14 Zambia Demographic and Health Survey (DHS)

	Population N from Zambia DHS	Proportion of population N from Zambia DHS	Sample n	Proportion of sample n	Weight
Males, ages 15-19	133 (3,246*0.041)	17.39%	83	30.51%	0.5700 (.1739/0.3051)
Females, ages 15-19	157 (3,273*0.048)	20.52%	90	33.09%	0.6201 (.2052/0.3309)
Males, ages 20-24	168 (2,307*0.073)	21.96%	28	10.29%	2.1341 (.2196/0.1029)
Females, ages 20-24	307 (2,745* 0.112)	40.13%	71	26.10%	1.538 (.4013/0.2610)
Total	765		272		

Ethical considerations

Informed consent was obtained from each participant by a study team member in a private space in or near the health clinic. Drawing on the WHO ethical and safety recommendations,⁸⁶ the consent forms used broad terms to describe the research topic to the caregiver (e.g. health, safety) to protect minors for whom the caregiver may be the perpetrator of violence; however, consent forms for the youth themselves included more detailed description of the nature of the survey questions. Research staff members completed a training that addressed ethical considerations, including ethics pertaining to violence-related research. To minimize under-reporting, violence questions were preceded by less sensitive topics and introductory text was used to help participants feel more comfortable disclosing their experiences and avoid interpreting the questions as judgmental, blaming, or stigmatizing.⁸⁶

Based on the safety protocol, participants were automatically referred to a HCP at each clinic if they reported severe past-year physical violence, lifetime sexual violence, or past-week thoughts of suicide. HCPs responded according to clinical practice, local

policy, and Zambian law. Ethical approval was obtained from the Johns Hopkins Bloomberg School of Public Health Review Board and the ERES Converge ethical review board in Zambia. The Zambia Ministry of Health through the National Health Research Authority also reviewed and approved the research.

4.4 Results

Sample characteristics

Data were analyzed for 272 participants of 276 enrolled; three were excluded from analysis for not meeting the inclusion criteria of being on ART for at least six months and one baseline survey was missing from the database. In the weighted sample, about two-thirds were female (60.1%) and about two-thirds were aged 20-24 years (61.8%) (Table 5). A high proportion had completed primary school (89.1%), and about 11% were currently employed at the time of the survey. Only 5%—all female—were currently married. Three-quarters reported having lost at least one parent (75.5%) and a similar percent reported having acquired HIV perinatally (71.0%). Almost two-thirds (61.4%) had been on ART for six or more years.

Table 5. Sample characteristics of adolescents and young adults living with HIV in Ndola, Zambia, stratified by sex

	Total	Male	Female	P value
	272 (100%)	108 (39.9%)	163 (60.1%)	//
Age				
15-19	104 (38.2%)	48 (44.2%)	56 (34.2%)	0.12
20-24	168 (61.8%)	60 (55.8%)	107 (65.8%)	
Completed primary school (n=271)				
Completed	242 (89.1%)	104 (96.3%)	137 (84.3%)	<0.001
Did not complete	30 (10.9%)	4 (3.7%)	25 (15.7%)	
Currently employed				
No	241 (88.9%)	98 (91.0%)	143 (87.5%)	0.50
Yes	30 (11.1%)	10 (9.0%)	20 (12.4%)	
Orphanhood				
None	67 (24.6%)	20 (18.8%)	46 (28.4%)	0.26
Single orphanhood	105 (38.9%)	43 (40.2%)	62 (38.0%)	
Double orphanhood	99 (36.6%)	44 (41.1%)	55 (33.6%)	
Marital status (n=271)				
Single	256 (94.3%)	108 (100%)	148 (91.4%)	0.006
Married	14 (5.1%)	0 (0%)	14 (8.6%)	
Mode of HIV acquisition				
From parents	193 (71.0%)	88 (80.9%)	105 (64.4%)	<0.001
Through sex	34 (12.4%)	1 (0.5%)	33 (20.0%)	
Another way	14 (5.0%)	6 (5.2%)	8 (4.9%)	
Don't know/refused	32 (11.6%)	15 (13.4%)	17 (10.5%)	
Time on ART treatment (n=269)				
6 months to <3 years	66 (24.2%)	13 (11.8%)	53 (32.4%)	<0.001
3 to <6 years	37 (13.7%)	10 (8.9%)	28 (16.9%)	
6+ years	167 (61.4%)	85 (78.7%)	81 (50.0%)	

Notes: n's and percentages are weighted; % are column percentages; p values are from F tests.

Prevalence of violence victimization

The estimated prevalence of violence victimization (physical violence, psychological abuse, or forced sex) among HIV-positive AYA in Zambia was 78.2% for lifetime reports and 73.5% for past-year reports (Table 6). Across both timeframes assessed, psychological abuse was most common (70.4% lifetime, 65.3% past-year), followed by physical violence (50.8% lifetime, 44.7% past-year), and forced sex (10.5% lifetime, 4.7% past-year). Among victims of physical violence, over one third (36.9%

lifetime, 34.0% past-year) experienced severe physical violence. Among lifetime victims of forced sex, the age at the first experience of forced sex ranged from 15 to 21 years for males (mean=16.8 years, standard deviation, SD=1.8) and 4 to 24 years for females (mean=16.3 years, SD=4.8). Almost half of HIV-positive AYA experienced polyvictimization in their lifetimes (46.1%), and over a third in the past year (37.8%) (Table 6).

Table 6. Estimated lifetime and past-year prevalence of violence victimization among adolescents and young adults living with HIV in Zambia (n=272)

	Lifetime % (95%CI)	Past year % (95%CI)	Past year, stratified by sex		
			Male (n=108) % (95%CI)	Female (n=163) % (95%CI)	p value
Any violence					
Physical, psychological, or forced sex	78.2 (72.0, 83.4)	73.5 (67.0, 79.1)	72.0 (60.3, 81.2)	74.5 (66.6, 81.1)	0.69
Type of violence					
Physical violence [^]	50.8 (43.9, 57.5)	44.7 (38.1, 51.5)	43.2 (32.5, 54.7)	45.7 (37.4, 54.1)	0.73
Moderate physical	95.6 (90.3, 98.1)	95.5 (89.5, 98.2)	97.5 (90.3, 99.4)	94.3 (84.5, 98.0)	0.33
Severe physical	36.9 (28.4, 46.4)	34.0 (25.3, 43.9)	22.8 (11.9, 39.1)	41.0 (29.6, 53.5)	0.07
Psychological abuse	70.4 (63.9, 76.2)	65.3 (58.6, 71.5)	65.3 (53.6, 75.4)	65.3 (57.0, 72.8)	0.99
Forced sex	10.5 (7.0, 15.5)	4.7 (2.6, 8.4)	4.1 (1.4, 11.5)	5.1 (2.5, 10.1)	0.75
Polyvictimization*					
No violence	21.8 (16.6, 28.0)	26.5 (20.9, 33.0)	28.1 (18.8, 39.7)	25.5 (18.9, 33.4)	
1 type of violence	32.2 (26.2, 38.8)	35.7 (29.4, 42.6)	33.4 (23.6, 44.8)	37.3 (29.4, 45.9)	0.84
2+ types of violence	46.1 (39.4, 52.9)	37.8 (31.4, 44.5)	38.6 (28.3, 50.0)	37.2 (29.5, 45.7)	

Notes: n and percentages are weighted; % are column percentages and may not add up to 100, since participants could select more than one form of violence. p values are from F tests.

[^]Percentages for moderate and severe physical violence are among those reporting any physical violence (n=212 lifetime, n=199 past-year).

*Categories are mutually exclusive.

The prevalence or type of violence experienced did not significantly differ between males and females, including forced sex (past-year prevalence: 4.1% for males and 5.1% for females, p=0.75). Among AYA who experienced past-year physical violence, females experienced more severe physical violence (41.0% vs. 22.8% among males) but this difference did not reach statistical significance (p=0.07) (Table 6). For

specific acts, females had a higher frequency of reports of being ‘kicked, dragged, or severely beaten up’ ($p<0.05$) and ‘locked inside or outside the home’ ($p<0.001$) than males in the past year (Table 7).

Heavy overlap was observed across all three forms of violence, and especially for psychological abuse and physical violence (Figure 5). Forced sex was always accompanied with physical or psychological violence, for weighted lifetime and past-year reports.

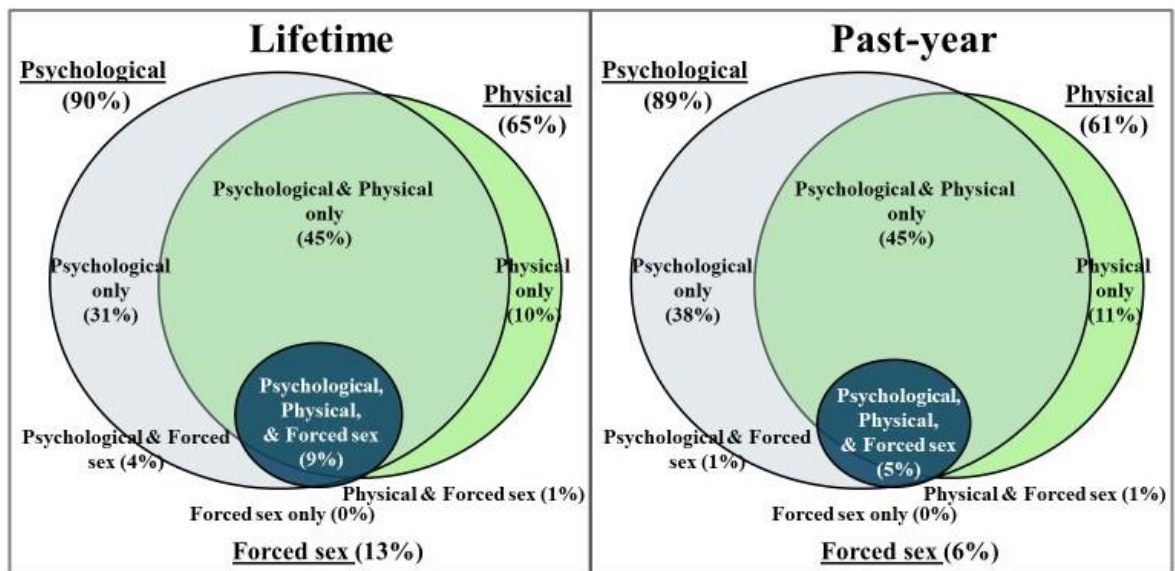


Figure 5. Overlapping experiences of physical violence, psychological abuse, and forced sex ever (weighted n=212) and in the past year, (weighted n=199) among the AYA reporting violence victimization

Table 7. Lifetime and past-year prevalence of individual acts of violence victimization among adolescents and young adults living with HIV in Zambia, stratified by sex

	Lifetime		Past-year		Past-year prevalence, by sex				
					Male		Female		P value
Physical violence									
Slapped or thrown at by something	32.4	(26.5, 39.0)	28.4	(22.8, 34.8)	23.3	(15.4, 33.7)	31.8	(24.2, 39.8)	0.18
Pushed or shoved	15.5	(11.2, 20.9)	14.4	(10.2, 19.6)	16.5	(9.8, 26.4)	13.0	(8.3, 19.6)	0.49
Ear or arm twisted as punishment	24.3	(19.0, 30.4)	20.8	(15.9, 26.7)	22.2	(14.4, 32.6)	19.9	(14.1, 27.3)	0.68
Hit with a fist or with something else that could hurt (e.g. stick/cane)	15.2	(11.0, 20.5)	12.6	(8.9, 17.6)	8.8	(4.3, 17.2)	15.2	(10.1, 22.0)	0.17
Kicked, dragged, or severely beaten up	4.8	(2.7, 8.4)	4.6	(2.5, 8.2)	1.6	(0.5, 4.9)	6.5	(3.3, 12.2)	0.02
Choked or burnt on purpose	0.9	(0.3, 2.4)	0.9	(0.3, 2.4)	0.5	(0, 3.8)	1.1	(3.6, 3.5)	0.50
Threatened with/used a sharp object or other weapon	3.7	(1.9, 7.2)	2.3	(1.2, 4.7)	1.1	(0.3, 4.3)	3.2	(1.4, 6.9)	0.16
Psychological abuse									
Insulted or made to feel bad	64.9	(58.2, 71.0)	59.7	(52.9, 66.2)	58.1	(46.5, 68.9)	60.8	(52.4, 68.6)	0.70
Belittled or humiliated in front of other people	31.7	(25.7, 38.3)	29.5	(23.6, 36.1)	27.8	(18.9, 38.9)	30.6	(23.3, 39.0)	0.67
Threatened with leave or abandonment	18.8	(14.1, 24.7)	17.2	(12.7, 22.8)	13.4	(7.6, 22.7)	19.8	(13.9, 27.4)	0.23
Locked inside or outside the home	9.8	(6.5, 14.6)	8.1	(5.1, 12.5)	1.1	(0.3, 4.2)	12.7	(7.9, 19.7)	<0.001
Threatened with harmful people, ghosts or evil spirits	5.3	(3.0, 9.1)	3.8	(2.0, 7.4)	3.6	(1.1, 11.3)	4.1	(1.9, 8.6)	0.84
Skin color/ gender/ religion/ tribe/ or health problems referred to in hurtful way	16.7	(12.1, 22.5)	13.3	(9.3, 18.7)	12.8	(6.7, 22.9)	13.7	(8.9, 20.5)	0.86
Forced sex									
Physically forced to have sexual intercourse when did not want to	10.4	(6.9, 15.5)	4.7	(2.6, 8.3)	4.1	(1.4, 11.5)	5.0	(2.4, 10.0)	0.75

Notes: Figures are weighted proportion (95% confidence interval); % are column percentages and may not add up to 100, since participants could select more than one form of violence. p values are from F tests.

In Venn diagrams for past-year violence victimization stratified by sex, weighted estimates did not significantly differ between males and females (Figure 6).

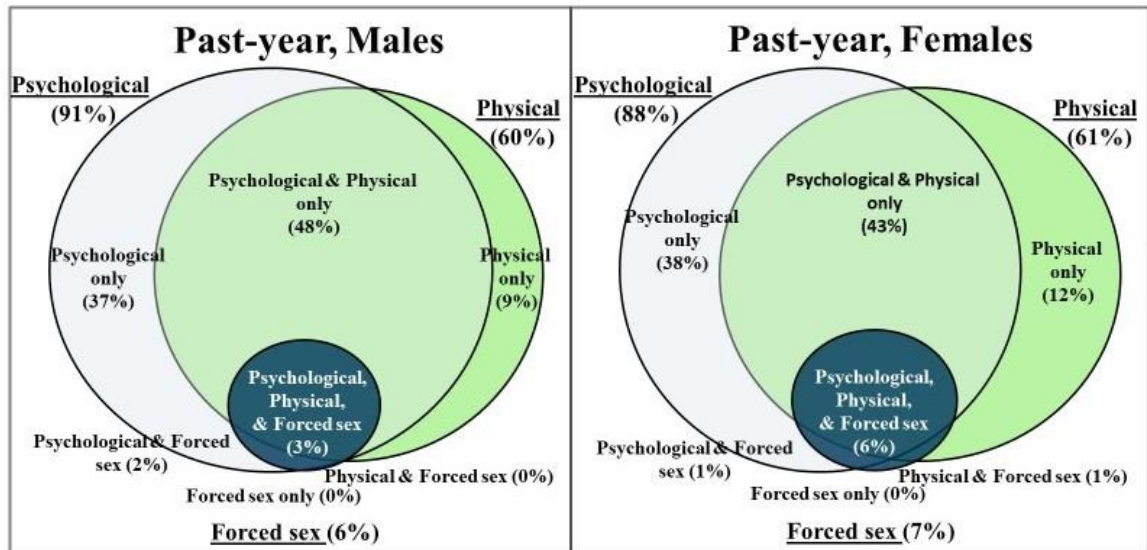


Figure 6. Overlapping experiences of physical violence, psychological abuse, and forced sex in the past year (weighted n=199) among male and female AYA reporting violence victimization

When we disaggregated prevalence and perpetrators by participant age (15-19, and 20-24 years) and sex (Table 8), we found that among AYA ages 15-19, males compared to females experienced significantly higher levels of past-year psychological abuse (71.1% vs. 55.6%, $p<0.05$). Across both age groups, males experienced more friend/peer violence than females, but the difference only reached significance for AYA ages 15-19 years (57.8% vs. 33.3%, $p<0.01$).

Table 8. Estimated prevalence of past-year violence against adolescents and young adults living with HIV in Zambia, stratified by age group and sex (n=272)

	Total % (95%CI)	Ages 15-19 (n=104)			Ages 20-24 (n=168)		
		Male (n=48) % (95%CI)	Female (n=56) % (95%CI)	p value	Male (n=60) % (95%CI)	Female (n=107) % (95%CI)	p value
Any victimization							
Physical, psychological, or forced sex	73.5 (67.0, 79.1)	77.1 (66.7, 83.2)	68.9 (58.5, 77.6)	0.23	67.9 (48.5, 82.6)	77.5 (66.1, 85.8)	0.33
Type of victimization							
Physical violence	44.7 (38.1, 51.5)	48.2 (37.6, 59.0)	52.2 (41.9, 62.4)	0.60	39.3 (23.0, 58.3)	42.3 (31.2, 54.2)	0.79
Psychological abuse	65.3 (58.6, 71.5)	71.1 (60.4, 79.9)	55.6 (45.1, 65.5)	0.04	60.7 (41.7, 77.0)	70.4 (58.6, 80.0)	0.36
Forced sex	4.7 (2.6, 8.4)	4.8 (1.8, 12.3)	6.7 (3.0, 14.2)	0.60	3.6 (0.5, 22.0)	4.2 (1.3, 12.5)	0.88
Any victimization by perpetrator group							
Romantic partner	16.3 (11.8, 22.1)	3.6 (1.2, 10.7)	15.6 (9.4, 24.7)	0.009	3.6 (0.5, 22.0)	29.6 (20.0, 41.4)	0.007
Parent/caregiver	20.4 (15.7, 26.0)	24.1 (16.0, 34.5)	30.0 (21.4, 40.3)	0.39	7.1 (1.8, 25.0)	21.1 (13.0, 32.4)	0.10
Other family member	31.0 (25.1, 37.7)	30.1 (21.2, 40.9)	33.3 (24.3, 43.8)	0.65	32.1 (17.5, 51.5)	29.6 (20.0, 41.4)	0.80
Friend/peer	41.6 (35.0, 48.4)	57.8 (46.9, 68.1)	33.3 (24.3, 43.8)	0.002	50.0 (32.0, 68.0)	33.8 (23.6, 45.7)	0.14
School staff member	9.4 (6.3, 13.7)	15.7 (9.3, 25.2)	17.8 (11.1, 27.2)	0.71	10.7 (3.4, 28.9)	1.4 (0.2, 9.6)	0.04
Stranger	10.3 (6.9, 15.2)	8.4 (4.0, 16.7)	7.8 (3.7, 15.5)	0.88	0	18.3 (10.8, 29.3)	0.004
Neighbor	3.9 (2.1, 7.0)	3.6 (1.2, 10.7)	7.8 (3.7, 15.5)	0.24	0	4.2 (1.3, 12.5)	0.19
Someone else*	6.7 (4.1, 10.8)	7.2 (3.3, 15.3)	8.9 (4.5, 16.9)	0.69	3.6 (0.5, 22.0)	7.0 (2.9, 16.0)	0.52

Notes: Figures are weighted percentages (95% CI); % are column percentages and may not add up to 100, since participants could select more than one form of violence. p values are from F tests.

*An employer, health care provider, military/police, religious leader, and/or someone else the youth knows.

In the sensitivity analysis, when restricting to two or more acts of psychological abuse from at least one perpetrator group, the prevalence of past-year psychological victimization decreased from 65.3% to 52.0% (Table 9). The prevalence of any past-year violence victimization decreased from 73.5% to 64.1% and of past-year polyvictimization from 37.8% to 34.1%.

Table 9. Past-year prevalence of violence victimization among adolescents and young adults living with HIV in Zambia, stratified by sex, restricting to 2+ acts of psychological abuse from at least one perpetrator group (n=272)

Violence victimization	Total		Stratified by sex				p value [^]
	%	(95%CI)	Male %	(95%CI)	Female %	(95%CI)	
Any violence	64.1	(57.3, 70.4)	65.2	(53.6, 75.2)	63.4	(54.9, 71.1)	0.80
Psychological abuse only	52.0	(45.2, 58.8)	56.9	(45.4, 67.7)	48.7	(40.4, 57.2)	0.26
Polyvictimization							
No violence	35.9	(30.0, 42.7)	34.8	(24.8, 46.4)	36.6	(28.9, 45.1)	
1 type of violence	30.0	(24.1, 36.6)	28.2	(19.1, 39.5)	31.2	(23.9, 39.6)	0.77
2+ types of violence	34.1	(27.9, 40.8)	37.0	(26.8, 48.5)	32.2	(24.8, 40.5)	

Notes: Percentages are weighted; % are column percentages and may not add up to 100, since participants could select more than one form of violence. p values are from F tests. Respondents classified as non-victims if reporting a single act of psychological abuse from a single perpetrator group.

Perpetrators of past-year of violence

Among past-year victims of violence, females compared to males experienced significantly higher levels of any past-year violence from a romantic partner (33.3% versus 5.0%, $p<0.001$), parent/caregiver (32.4% versus 17.6%, $p=0.02$), and stranger (19.7% vs. 5.2%, $p<0.001$) (Figure 7 and Table 10). Both male and female victims of past-year violence experienced high levels from a friend or peer, especially psychological abuse. However, compared to females, male victims of past-year violence had significantly higher levels of any friend/peer victimization (74.3% vs. 45.1%, $p<0.001$), with the strongest evidence for a difference by sex found for physical violence (compared to psychological abuse) from a friend/peer. Experiencing violence from multiple

perpetrator groups was common, as less than half of past-year victims were victims of violence from a single perpetrator type (42.0%) (Table 10).

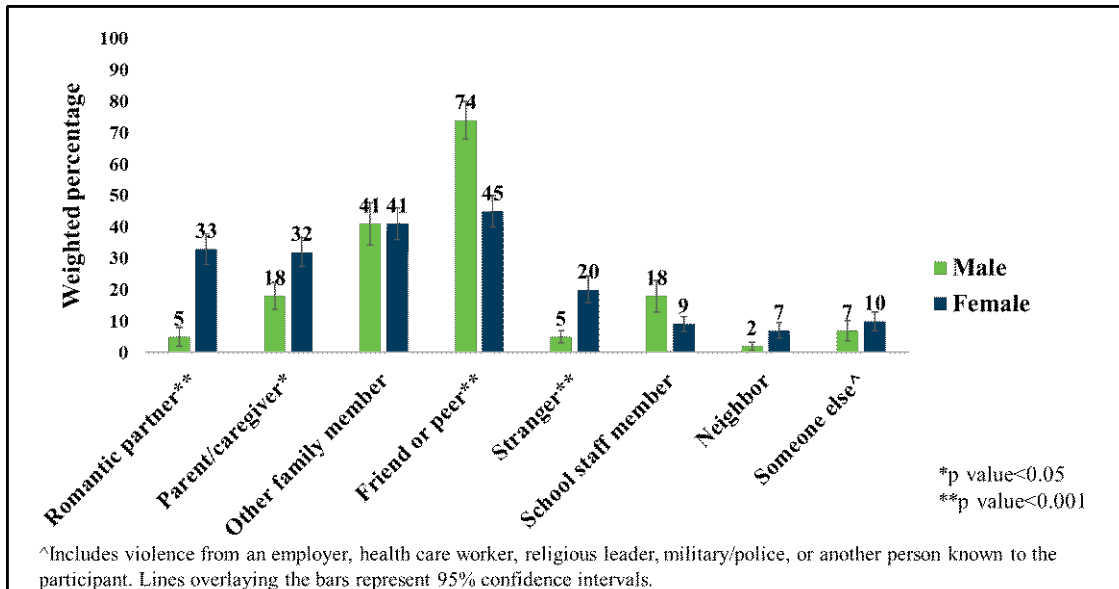


Figure 7. Differences in perpetrators of any past-year violence by sex among HIV-positive adolescent and young adult victims (ages 15-24 years) in Zambia

Table 10. Perpetrators of past-year violence against adolescents and young adults living with HIV in Zambia, among those who report past-year violence, stratified by sex

	Total % (95%CI)	Male % (95%CI)	Female % (95%CI)	p value[^]
Any victimization (n=199)				
Romantic partner	22.1 (16.2, 29.6)	5.0 (1.5, 15.4)	33.3 (24.5, 43.4)	<0.001
Parent/ caregiver	26.6 (20.6, 33.7)	17.6 (10.7, 27.5)	32.4 (24.0, 42.1)	0.02
Other family member	41.1 (33.6, 49.1)	40.7 (28.5, 54.1)	41.4 (32.1, 51.4)	0.93
Friend or peer	56.5 (48.5, 64.2)	74.3 (61.1, 84.2)	45.1 (35.6, 55.1)	<0.001
School staff member	12.7 (8.6, 18.4)	17.9 (10.0, 30.0)	9.4 (5.7, 15.2)	0.09
Stranger	14.1 (9.4, 20.4)	5.2 (2.4, 10.8)	19.7 (12.8, 29.2)	<0.001
Neighbor	5.3 (2.9, 9.5)	2.2 (0.7, 6.8)	7.3 (3.7, 13.9)	0.06
Someone else**	9.1 (5.6, 14.5)	7.2 (2.9, 16.7)	10.3 (5.7, 17.8)	0.50
Physical violence (n=121)				
Romantic partner	17.0 (10.5, 26.4)	0	27.7 (17.5, 40.8)	<0.001
Parent/ caregiver	28.3 (20.6, 37.5)	17.3 (9.7, 28.8)	35.3 (24.5, 47.7)	0.02
Other family member	27.2 (19.5, 36.6)	22.8 (11.9, 39.1)	30.0 (20.2, 42.0)	0.43
Friend or peer	34.3 (25.3, 44.5)	59.4 (42.4, 74.4)	18.5 (10.8, 29.8)	<0.001
School staff member	20.9 (14.3, 29.7)	29.9 (17.0, 47.0)	15.4 (9.3, 24.4)	0.07
Stranger	2.3 (0.6, 7.7)	0	3.7 (1.1, 12.2)	0.21
Neighbor	0.5 (0.0, 3.4)	1.2 (0.2, 8.6)	0	0.22
Someone else**	2.7 (0.9, 7.8)	3.7 (1.1, 11.3)	2.0 (0.3, 13.3)	0.60
Psychological abuse (n=177)				
Romantic partner	16.3 (10.8, 23.8)	3.9 (0.8, 17.2)	24.5 (16.3, 35.1)	0.01
Parent/ caregiver	19.5 (13.8, 26.6)	11.2 (5.5, 21.4)	24.9 (16.9, 35.0)	0.03
Other family member	37.9 (30.1, 46.5)	40.7 (27.9, 55.0)	36.1 (26.6, 46.7)	0.59
Friend or peer	53.7 (45.2, 62.0)	67.8 (53.5, 79.4)	44.3 (34.1, 55.1)	0.01
School staff member	0.4 (0, 2.5)	0	0.6 (0, 4.1)	0.42
Stranger	14.6 (9.7, 21.5)	5.7 (2.6, 11.9)	20.5 (13.0, 30.9)	<0.01
Neighbor	5.7 (3.0, 10.4)	1.6 (0.4, 6.5)	8.3 (4.2, 15.8)	0.02
Someone else**	7.7 (4.4, 13.1)	1.6 (0.4, 6.5)	11.8 (6.5, 20.2)	0.00
Forced sex (n=13)				
Romantic partner	57.2 (24.3, 84.8)	9.1 (1.7, 36.4)	48.2 (19.1, 78.5)	0.13
Parent/ caregiver	0	0	0	//
Other family member	0	0	0	//
Friend or peer	9.4 (1.8, 37.4)	4.5 (0.5, 33.3)	4.9 (0.5, 35.0)	0.72
School staff member	0	0	0	//
Stranger	0	0	0	//
Neighbor	0	0	0	//
Someone else**	33.4 (9.1, 71.4)	21.5 (3.7, 66.2)	11.9 (1.3, 58.7)	0.20
Number of perpetrator types* (n=201)				
1 perpetrator type	42.0 (34.3, 50.2)	46.8 (33.9, 60.1)	39.0 (29.8, 49.1)	0.09
2 perpetrator types	34.2 (27.1, 42.1)	39.4 (27.4, 52.7)	30.8 (22.5, 40.7)	
3 perpetrator types	18.2 (13.1, 24.7)	10.9 (5.6, 20.3)	22.9 (15.7, 32.0)	
4+ perpetrator types	5.6 (3.1, 9.8)	3.0 (1.1, 7.8)	7.3 (3.7, 13.9)	

Notes: n's and percentages are weighted; % are column percentages and may not add up to 100, since participants could select more than one form of violence; percentages are for perpetrator groups among those reporting a given form of violence; p values are from F tests.

*Of those reporting any violence victimization

**An employer, health care provider, military/police, religious leader, and/or someone else the youth knows.

4.5 Discussion

Almost three-quarters of HIV-positive AYA, aged 15-24 years, in Zambia are estimated to have experienced both lifetime and past-year violence victimization, which is especially concerning since experiencing violence may relate to poor HIV-care and treatment outcomes among HIV-positive young people in SSA.⁶ Compared to the Cluver et al. study among a younger population of HIV-positive adolescents (ages 10-19 years) in South Africa,⁶ we identified a similar prevalence of past-year violence from caregivers and peers and lower prevalence of past-year violence from teachers, clinicians, and community members. When examining our findings within the context of VACS among general populations of male and female adolescents in Zambia¹² and other SSA countries,^{87, 88} the prevalence of physical violence was roughly similar while levels of psychological abuse were higher in our study—even for the more conservative measure of psychological abuse used in the sensitivity analysis. The Zambian DHS found a lower prevalence of past-year physical violence among ever-partnered young women aged 15-19 years (26% vs. 52% in our study), while reports of physical violence among women aged 20-24 years and of sexual violence among women aged 15-24 years were generally comparable.¹¹

Similar to several VACS studies among adolescents in the region,^{12, 87-89} we found no statistically significant differences in the overall prevalence of physical and emotional violence according to the youth's sex. However, we identified nuanced differences in the perpetrators of violence against male versus female HIV-positive AYA: friends and peers are a dominant perpetrator of physical and psychological abuse against males, whereas experiences of violence for females span more evenly across a range of perpetrators (i.e.

romantic partners, parents/caregivers, other family members, and friends/peers). These findings are important because previous studies of violence against HIV-positive youth in SSA, albeit limited in number, have not disaggregated perpetrators of violence according to the youth's sex.^{6, 30}

Differences observed in the perpetrators of violence for male compared with female HIV-positive AYA highlight the need for prevention and response efforts that are tailored to the youth's sex and the perpetrator group. HIV clinics must recognize that a large proportion of their AYA patient populations may have experienced violence. While interventions have been developed to integrate IPV screening for women into standard care procedures in HIV centers in some settings in SSA,⁹⁰ screening programs should also be developed for HIV-positive AYA to assess experiences of multiple forms of violence from a range of perpetrators. Such screening could take the form of asking whether a given form of violence has occurred, followed by a question about who perpetrated the violence, with the perpetrator types read aloud to ensure that violence from all possible perpetrators is captured. The Abuse Assessment Screening tool, originally designed for clinical screening of abuse during pregnancy,⁹¹ adopts a similar approach and could be adapted for such purposes. Beyond clinics, schools and households may be critical settings to target with violence prevention initiatives, since violence against HIV-positive AYA in this study was common from friends or peers as well as from family members. Although researchers have begun to develop programs to address parental violence against youth in SSA,⁹² results from this study suggest that for HIV-positive AYA, interventions must also engage other family members in the home.

Our findings also have implications for the measurement of psychological abuse and sexual violence. Results from our sensitivity analysis reinforce calls in the literature to expand data collection efforts and clarify operational definitions for psychological abuse.^{83, 84, 93} Compared to physical and sexual violence, psychological abuse has received considerably less attention in studies of violence and HIV, reflecting its challenging measurement properties and a perception among some that it does less harm than physical or sexual violence.^{83, 94} A WHO research initiative seeking clarity on measurement of psychological IPV will support these efforts.⁸⁴ Importantly, our results underscore the need for such initiatives to explore the measurement of psychological abuse among male as well as female HIV-positive AYA and to include multiple perpetrator groups.

Our removal of three ICAST-C measures of sexual violence suggests value in further testing these items among older youth who are in intimate partnerships. Youth may not interpret being “made” to do something as an act of coercion,⁹⁵ particularly where items have been translated into other languages. The results regarding forced sex, however, found that male and female HIV-positive AYA have similar prevalence estimates. Although surprising since reports are typically higher among females compared with male adolescents in SSA^{87, 88}—including in Zambia¹²—one study conducted with adolescents in South Africa, ages 14-19 years, also found no significant differences in the lifetime prevalence of forced sex victimization (14.3% among females and 10.8% among males).⁹⁶ Taken together, these findings suggest a need for further research on the measurement and experience of sexual violence among young HIV-positive men in addition to women in the region.

Limitations and strengths

There are limits to this analysis that warrant consideration. First, we analyzed only one item to assess sexual violence victimization, which may not have captured the full range of AYA sexual violence experiences. Given that AYA were sampled from clinics, findings may not reflect the experiences of violence among AYA who are not seeking care for their HIV. Additionally, given the small proportion of our sample who reported being married, findings may not reflect the experiences of violence among AYA living with HIV who are married. Furthermore, we did not ask HIV-positive AYA about the perceived motivation behind the violence they experienced, and hence conclusions cannot be drawn about the extent to which these experiences of violence stem from the youth's HIV status.

Despite these limitations, this study fills an important gap in the literature on violence against HIV-positive AYA in SSA. Key strengths of this study include its focus on multiple types and perpetrators of violence against HIV-positive AYA, and its inclusion of both males and females, as well as adolescents (15-19 years) and young adults (20-24 years). In contrast, large international surveys have typically been limited to examining experiences of violence among general populations of either children up to age 18 (e.g. the Centers for Disease Control and Prevention's VACS) or women only (e.g. DHS). There has been virtually no previous research on violence victimization among young HIV-positive men ages 20-24 years in SSA.

4.6 Conclusions

These results offer critical insight into an important public health and human rights issue within a vulnerable population whose experiences of violence are widespread but have received little attention to date. Study findings highlight the importance of developing targeted prevention and response efforts that are tailored to the youth's sex and the perpetrator group. Such efforts are needed to address the harmful short- and long-term effects of violence and may also help to prevent the onward transmission of HIV. Future studies should further investigate the intersections between violence victimization and HIV care and treatment outcomes, as well as meanings and operational definitions of psychological abuse and sexual violence, among HIV-positive AYA in sub-Saharan Africa.

Chapter 5. **Violence victimization and viral load failure among adolescents and young adults living with HIV in Zambia**

5.1 Abstract

Background: The relationship between violence and HIV outcomes has received little attention among adolescents and young adults (AYA) living with HIV in sub-Saharan Africa. We examined associations between past-year violence victimization and viral load (VL) failure among male and female AYA, aged 15-24, in Ndola, Zambia.

Methods: We analyzed cross-sectional data from consecutively-sampled AYA in four HIV clinics. Measures of past-year physical violence, psychological abuse, and forced sex were adapted from the ICAST-C and WHO Multi-Country Study on Women's Health and Domestic Violence. Using logistic regression, we derived associations between VL failure ($\geq 1,000$ copies/mL) and: 1) any violence; 2) types of violence; 3) perpetrators of violence; and 4) polyvictimization.

Results: Among 272 AYA (59.2% female, 72.8% perinatally infected), 73.5% (n=200) experienced past-year violence and 36.8% (n=100) had VL failure. In adjusted models, higher odds of VL failure were observed for participants who reported high frequency of any violence versus no violence victimization (adjusted OR, aOR: 3.58; 95%CI: 1.14-11.27), high frequency of psychological abuse versus no psychological abuse (aOR: 3.32; 95%CI: 1.26-8.70), any versus no violence from a family member other than a parent/caregiver for physical violence (aOR: 2.18, 95%CI: 1.05-4.54) and psychological abuse (aOR: 2.50; 95%CI: 1.37-4.54), and any versus no physical violence from a friend/peer (aOR: 2.14, 95%CI: 1.05-4.36).

Conclusions: Past-year violence victimization was associated with VL failure when considering the frequency, type, and perpetrator of violence. Programs addressing violence among AYA living with HIV may be critical to improving viral suppression and preventing onward transmission.

5.2 Introduction

Despite significant progress made in HIV prevention, care, and treatment in the past decade,⁹⁷ HIV remains a leading cause of death among adolescents and young adults (AYA), ages 15-24 years, in sub-Saharan Africa.⁹⁸ Compared to adults, AYA in the region demonstrate lower levels of antiretroviral therapy (ART) adherence and viral suppression.^{2, 3, 99} A national survey in Zambia found that only 34.3% of young people living with HIV ages 15-24 years had achieved viral suppression, compared to 79.0% of older adults ages 45-59 years.⁵⁰

Violence is also a leading cause of death among AYA,⁹⁸ and levels of violence against AYA are among the highest in sub-Saharan Africa compared to other regions.^{4, 5} In Zambia, 43% of female and 34% of male adolescents ages 13-17 have experienced past-year physical, emotional, or sexual violence.¹² Among young women aged 20-24 years, over one-third have experienced past-year physical violence and one-tenth have experienced past-year sexual violence.¹¹

Researchers are increasingly recognizing violence as a barrier to ART adherence and viral suppression among people who are living with HIV (primarily women),^{9, 10} including in sub-Saharan Africa.¹⁰⁰⁻¹⁰² Threats or acts of violence from a controlling intimate partner can directly affect a woman's ability to access the clinic for ART or

adhere to their medication.^{103, 104} Violence victimization is also associated with greater likelihood of psychological distress,³⁴ depression,³⁵ and alcohol use,³⁶ which are known barriers to medication adherence among adults³⁷ and may in turn prevent viral suppression and exacerbate risk of onward transmission.¹⁰⁵

Despite the growing literature exploring the links between violence victimization and ART adherence and viral suppression among adult women, only three studies were identified as having assessed this relationship among youth in sub-Saharan Africa.⁶⁻⁸ These studies found associations between ART non-adherence and: exposure to violence in the home in Malawi⁸ and exposure to violence from multiple perpetrators in the Eastern Cape, South Africa,⁶ among both male and female adolescents; and physical or sexual intimate partner violence against female adolescents in Soweto, South Africa.⁷ The study from the Eastern Cape found that non-adherence to ART increased with youths' experiences of multiple types of violence victimization,⁶ echoing similar findings from a study among perinatally-infected adolescents in the U.S. which found associations between higher levels of violence exposure and both unsuppressed viral load (>400 copies/mL) and a CD4 of less than 25%.¹⁰⁶ Such research is important, as examining cumulative exposures to multiple forms of violence can provide a more comprehensive understanding of young people's experiences of violence,¹⁰⁷ and allow researchers to assess if such exposures are associated with negative health effects, including mental health problems and risk behavior.¹⁰⁸

Outside of South Africa, however, no studies in sub-Saharan Africa have conducted a detailed assessment of the association between violence victimization—including the frequency/severity, type, and perpetrator of the violence—and HIV

outcomes among male and female AYA living with HIV. Filling these gaps in knowledge is particularly important since youth are in a developmental stage characterized by cognitive, psychosocial, emotional, and social changes¹⁵; hence, we cannot assume that the associations between violence victimization and HIV outcomes observed among adult women apply to AYA, especially males.

We sought to examine associations between past-year violence victimization and viral load (VL) failure among AYA living with HIV in Ndola, Zambia. We first tested potential associations between VL failure and any violence, types of violence, perpetrators of violence, and polyvictimization. We next examined the presence of statistical interactions to determine whether the associations observed differed according to the youth's sex or age group.

5.3 Methods

Sample and procedures

Analyses were conducted using cross-sectional baseline data from Project YES! (Youth Engaging for Success), a randomized controlled trial (RCT) conducted among AYA living with HIV, ages 15-24 years, attending four clinics in Ndola, Zambia. The trial compared an intervention and comparison group over time to assess the effects of a peer-mentoring intervention on youths' viral load suppression (<1,000 copies/mL), ART treatment adherence (gap of 48 or more consecutive hours), and internalized/self-stigma.¹⁰⁹ AYA were consecutively sampled on the following eligibility criteria: a) age 15-24 years, b) aware of their HIV status, c) on ART for six months or more, d) speaker

of English or Bemba, and e) available for study activities over 18 months (described in detail elsewhere¹⁰⁹).

In accordance with Zambian law, written informed consent was obtained from all participants age 18 and older.⁷⁰ For minors (ages 15-17 years), parental/caregiver permission and participant assent were obtained.⁷⁰ Participants completed baseline surveys between December 2017 to May 2018 in English or Bemba during face-to-face interviews, using Magpi software on tablet computers. Participants who reported experiences of severe violence or suicidal ideation were referred to designated healthcare providers at each clinic, in line with the study's safety protocol. Following the survey, participants underwent blood draws for HIV-1 RNA viral load testing using the Qiagene QiAmp viral RNA mini kit (QIAGEN, Germany). Study teams also collected clinical data from the patients' medical records, such as when the AYA initiated ART.

Measures

Viral load

AYA with a viral load test of $\geq 1,000$ copies of HIV-RNA/mL were categorized as having VL failure, in line with consolidated guidelines on HIV treatment and prevention from the Ministry of Health in Zambia and the World Health Organization (WHO).^{60, 61}

Physical violence
Moderate <ul style="list-style-type: none"> • Slapped you or thrown something at you that could hurt you? • Pushed or shoved you? • Twisted your ear or arm as punishment? Severe <ul style="list-style-type: none"> • Hit you with a fist or with something else that could hurt you, such as a stick or cane? • Kicked you, dragged you, or severely beaten you up? • Choked you or burnt you on purpose? • Threatened to use or actually used a sharp object or other weapon against you?
Psychological abuse
<ul style="list-style-type: none"> • Insulted you or made you feel bad about yourself? • Belittled or humiliated you in front of other people? • Threatened to leave or abandon you? • Locked you either inside or outside of the home? • Threatened to invoke harmful people, ghosts or evil spirits against you? • Referred to your skin color/ gender/ religion/ tribe/ or health problems you have in a hurtful way?
Sexual violence
<ul style="list-style-type: none"> • Made you watch a sex video or look at sexual pictures?*** • Made you look at their private parts or wanted to look at yours?*** • Touched your private parts in a sexual way, or made you touch theirs?*** • Physically forced you to have sexual intercourse when you did not want to?

***Removed during analysis stage given concerns that the non-consensual nature of the act was unclear.

Figure 8. Measures of violence victimization, adapted from the International Society for the Prevention of Child Abuse and Neglect Screening Tool-Child Instrument (ICAST-C) and the World Health Organization Multi-Country Study on Women’s Health and Domestic Violence against Women

Violence victimization

Violence victimization was measured using items from the International Society for the Prevention of Child Abuse and Neglect Screening Tool-Child Instrument (ICAST-C)⁵⁹ and the WHO Multi-Country Study on Women’s Health and Domestic Violence (WHO MCS).¹⁹ Items assessed past-year experiences of physical violence (7 items), psychological abuse (6 items), and sexual violence (4 items) (Figure 8). Items measuring physical violence were distinguished by severity level (three items for moderate and four items for severe violence).¹⁹ The frequency of the act in the past year was queried (never,

once, a few times, many times), and 12 possible perpetrator groups could be selected: romantic partner, parent or caregiver, other family member, friend or peer, stranger, school staff member, employer, health care worker, neighbor, religious leader, military/police, or someone else the youth knows. Three items assessing sexual violence were removed given a lack of clarity on whether the act was consensual (Merrill et al., unpublished). Violence measures were translated into Bemba, and the full instrument was pilot-tested among youth in Ndola for clarity and appropriateness.

Any violence: AYA were classified as having experienced *any violence* if reporting one or more behavioral acts of past-year violence victimization (physical violence, psychological abuse, or forced sex) versus no acts. Additionally, a continuous measure of violence victimization was generated to offer insight into the accumulation of harm.¹¹⁰ Specifically, the *frequency of any violence* was assessed by summing the frequency scores across each of the 14 measures of violence (score range: 0-no frequency to 42-high frequency).

Types of violence: Three measures were created to assess the specific types of violence experienced. A *severity-times-frequency measure of physical violence* was generated by multiplying the severity level (moderate-1, severe-2) by the frequency (never-0, once-1, a few times-2, many times-3) for each of the seven items and summing the scores across items (score range: 0-no severity/frequency to 42-high severity-times-frequency). This approach was modeled on the severity-times-frequency measure developed by the creator of the Conflict Tactics Scale.¹¹¹ The *frequency of psychological abuse* was assessed by summing the frequency scores across each of the six items (score

range: 0-no frequency to 18-high frequency). *Forced sex* was assessed as a binary variable (any versus no reports), given the small sample reporting this act.

Perpetrators of violence: Binary variables were generated for both “any” versus “no” reported physical violence and “any” versus “no” psychological abuse victimization from each of the following *perpetrator groups*: parent/caregiver, other family member, romantic partner, and friend/peer. Associations for the remaining perpetrator groups or for any perpetrator of forced sex were not assessed due to sparse data.

Polyvictimization: A categorical variable was generated for *polyvictimization* by grouping AYA according to their experience of zero, one, or two or more types of past-year violence (physical violence, psychological abuse, or forced sex).

Covariates

Covariates were considered if potentially associated with violence victimization and VL failure, and not on the causal pathway between the two. Socio-demographic characteristics included the youth’s age (15-19 or 20-24 years), sex, completion of primary school (yes or no), and orphan hood status (none, single orphan, or double orphan). HIV measures included the self-reported mode of HIV acquisition (from parents, through sex, or another way/don’t know/refused) and length of time on ART (6 months to 3 years, 3 to 6 years, or 6+ years). Study clinic was included as a covariate.

Analyses

Descriptive analyses were performed to estimate the proportion of the sample who reported VL failure, past-year violence, and the covariates of interest. Chi-square

tests were used to assess differences in proportions by VL failure for all variables. Categorical measures of violence were generated from continuous measures based on locally weighted scatterplot smoothing (lowess) plots of the association between the variable and VL failure. This approach was employed to make the models more robust against violations of the linearity assumption. We also conducted exploratory analyses to assess the degree of overlap between the forms of violence experienced.

Using logistic regression, we obtained crude and adjusted odds ratios, 95% confidence intervals, and p values (Wald tests) for the association between VL failure and: 1) any violence, including any versus no victimization (binary) and the frequency of any violence (categorical); 2) types of violence, including severity-times-frequency of physical violence (categorical), frequency of psychological abuse (categorical), and forced sex (binary); 3) perpetrators of violence, including any versus no physical violence by perpetrator group (binary variables for each group) and any versus no psychological abuse by perpetrator group (binary variables for each group); and 4) polyvictimization (categorical). When testing associations for the types of violence and perpetrators of violence, we included all variables assessing the type/perpetrator of violence in the adjusted models, in addition to the covariates, to determine whether any particular violence variable would show a stronger association with VL failure than the others. Missing item values were imputed as the referent, including completion of primary school (n=1, 0.3% of sample) and time on ART (n=3, 1.1% of sample).

All covariates were deemed theoretically important and therefore considered as candidates for inclusion in the adjusted models. Backwards elimination was used, where covariates were retained in adjusted models if reaching a significance level of 0.10 or if

the covariate substantially influenced the OR of the main association of interest (+/- 10%) upon removal. All adjusted models included the youth's sex and age, considered *a priori* covariates, as well as the study clinic as a fixed effect to account for the lack of independence of observations. Potential collinearity between any pairs of variables was examined using variance inflation factors. Hosmer-Lemeshow goodness of fit tests were conducted to assess the fit each model to the data. The final candidate multivariate models were extended to include an interaction term between the form of violence and the youth's sex and age group (15-19 versus 20-24 years), respectively. In post-hoc analyses, we also stratified estimates according to AYA sex. Analyses were conducted using STATA 14.⁸⁵

Ethics

Study procedures were in line with the WHO ethical and safety recommendations,⁸⁶ including: using broad terms to describe the research to youths' caregivers in case the caregiver was a perpetrator of violence; addressing ethical considerations for violence research in the study staff training; minimizing under-reporting by avoiding judgmental or stigmatizing interpretation of AYA experiences; and establishing a safety protocol to support victims of violence. Ethical approval for the study was obtained from the Johns Hopkins Bloomberg School of Public Health Review Board and the ERES Converge ethics review board in Zambia, and the research was reviewed and approved by the Zambia Ministry of Health through the National Health Research Authority.

5.4 Results

Of the 272 AYA included in the analyses, about two-thirds of the sample were female (59.2%, n=161) and a similar proportion (63.6%, n=173) were aged 15-19 years (Table 11). Most were perinatally infected (72.8%, n=198), a single or double orphan (73.2%, n=199), and had been on ART for 6 or more years (61.0%, n=166). About 88% (n=240) had completed primary school. Almost three-quarters (73.5%, n=200) reported any past-year experience of physical violence, psychological abuse, or forced sex. Over a third had viral load failure (36.8%, n=101).

Table 11. Violence variables and covariates for the association between past-year violence victimization and viral load failure among adolescents and young adults living with HIV in Ndola, Zambia (n=272), stratified by viral load failure

	Total 272 (100%)	Viral load		p value
		No failure 172 (63.2%)	Failure 100 (36.8%)	
Any violence				
No violence	72 (26.5%)	46 (26.7%)	26 (26.0%)	0.89
Any physical violence, psychological abuse, or forced sex	200 (73.5%)	126 (73.3%)	74 (74.0%)	
Frequency of any violence				
No violence (scores of 0)	72 (26.5%)	46 (26.7%)	26 (26.0%)	0.21
Single act of violence (scores of 1)	31 (11.4%)	22 (12.8%)	9 (9.0%)	
Moderate frequency (scores of 2-11)	150 (55.2%)	96 (55.8%)	54 (54.0%)	
High frequency (scores of 12-42)	19 (7.0%)	8 (4.7%)	11 (11.0%)	
Type of violence				
Severity-times-frequency of physical violence				
No physical violence (scores of 0)	144 (52.9%)	94 (54.7%)	50 (50.0%)	0.72
Single act of physical violence (scores of 1)	34 (12.5%)	21 (12.2%)	13 (13.0%)	
Moderate severity-times-frequency (scores of 2-7)	56 (20.6%)	36 (20.9%)	20 (20.0%)	
High severity-times-frequency (scores of 8-42)	38 (14.0%)	21 (12.2%)	17 (17.0%)	
Frequency of psychological abuse				
No psychological abuse (scores of 0)	96 (35.3%)	61 (35.5%)	35 (35.0%)	0.03
Single act of psychological abuse (scores of 1)	31 (11.4%)	21 (12.2%)	10 (10.0%)	
Moderate frequency (scores of 2-5)	111 (40.8%)	76 (44.2%)	35 (35.0%)	
High frequency (scores of 6-18)	34 (12.5%)	14 (8.1%)	20 (20.0%)	

Forced sex				
None	258 (94.9%)	164 (95.4%)	94 (94.0%)	0.63
Any	14 (5.2%)	8 (4.7%)	6 (6.0%)	
Perpetrator of violence				
Physical violence from a:				
Parent/caregiver	42 (15.4%)	26 (15.1%)	16 (16.0%)	0.84
Other family member	39 (14.3%)	18 (10.5%)	21 (21.0%)	0.08
Romantic partner	16 (5.9%)	12 (7.0%)	4 (4.0%)	0.31
Friend/peer	44 (16.2%)	20 (11.6%)	24 (24.0%)	0.008
Psychological abuse from a:				
Parent/caregiver	39 (14.3%)	29 (16.9%)	10 (10.0%)	0.12
Other family member	68 (25.0%)	34 (19.8%)	34 (34.0%)	0.009
Romantic partner	24 (8.8%)	16 (9.3%)	8 (8.0%)	0.72
Friend/peer	99 (36.4%)	60 (34.9%)	39 (39.0%)	0.50
Polyvictimization				
No violence	72 (26.4%)	46 (26.7%)	26 (26.0%)	0.77
1 type of violence	93 (34.2%)	61 (35.5%)	32 (32.0%)	
2 or 3 types of violence	107 (39.3%)	65 (37.8%)	42 (42.0%)	
Covariates				
Sex				
Male	111 (40.8%)	66 (38.4%)	45 (45.0%)	0.28
Female	161 (59.2%)	106 (61.6%)	55 (55.0%)	
Age				
15-19	173 (63.6%)	107 (62.2%)	66 (66.0%)	0.53
20-24	99 (36.4%)	65 (37.8%)	34 (34.0%)	
Primary school (n=271)				
Completed	240 (88.2%)	151 (87.8%)	90 (90.0%)	0.58
Did not complete	32 (11.8%)	21 (12.2%)	10 (10.0%)	
Mode of HIV acquisition				
From parents	198 (72.8%)	123 (71.5%)	75 (75.0%)	0.10
Through sex	27 (9.9%)	22 (12.8%)	5 (5.0%)	
Another way/don't know/refused	47 (17.3%)	27 (15.7%)	20 (20.0%)	
Time on antiretroviral therapy (n=269)				
6 months to <3 years	62 (22.8%)	42 (24.4%)	20 (20.0%)	0.44
3 to <6 years	44 (16.2%)	30 (17.4%)	14 (14.0%)	
6+ years	166 (61.0%)	100 (58.1%)	66 (66.0%)	
Orphanhood				
None	73 (26.8%)	49 (28.5%)	24 (24.0%)	0.68
Single orphan	112 (41.2%)	68 (39.5%)	44 (44.0%)	
Double orphan	87 (32.0%)	55 (32.0%)	32 (32.0%)	
Clinic				
Arthur Davison Children's Hospital	144 (52.9%)	85 (49.4%)	59 (59.0%)	0.34
Ndola Teaching Hospital	35 (12.9%)	26 (15.1%)	9 (9.0%)	
Lubuto Clinic	64 (23.5%)	43 (25.0%)	21 (21.0%)	
Twapia Clinic	29 (10.7%)	18 (10.5%)	11 (11.0%)	

Notes: Percentages are column percentages. Frequency scores were generated by summing the act's frequency (never-0, once-1, a few times-2, many times-3) across the number of acts of violence. Frequency-times-severity scores were generated by multiplying the act's severity level (moderate-1, severe-2) by its frequency, and summing across the number of acts of violence. Categories for violence scores were determined based on locally-weighted scatterplot smoothing (lowess) plots for the association between the variable and VL failure. P values are chi-square tests.

No evidence of an association was observed for any past-year violence victimization as a binary variable and VL failure (Table 12). The small proportion of the sample (7%, n=19) reporting a high frequency of any past-year violence (scores of 12-42) had 3.58 times the odds of VL failure compared to those who reported no past-year violence (95%CI: 1.14-11.27, $p<0.05$), after adjusting for covariates (Table 12).

Examining the types of violence (Table 12) revealed that the 12.5% of the sample (n=34) who reported a high frequency of past-year psychological abuse (scores of 6-18) had 2.49 times the odds of VL failure compared to AYA who had not experienced past-year psychological abuse (95%CI: 1.12-5.53, $p<0.05$) in crude analyses. This association strengthened to an adjusted odds ratio (aOR) of 3.32 (95%CI: 1.26-8.70, $p<0.01$), after adjusting for physical violence and forced sex in addition to covariates. In further assessments of the overlap in the types of violence experienced, we found that among those reporting a high frequency of past-year psychological abuse, about two-thirds (64.7%, n=22) also reported a high frequency of physical violence and/or any forced sex in the past year (not pictured).

Regarding the perpetrators of violence (Table 12), significant associations were observed for both physical violence (aOR: 2.18, 95%CI: 1.05, 4.54, $p<0.05$) and psychological abuse (aOR: 2.50, 95%CI: 1.37, 4.54, $p<0.01$) from a family member other than a parent or caregiver. Additionally, AYA who reported physical violence from a friend/peer, when compared to those who had not, had 2.14 times the odds of VL failure (95%CI: 1.05, 4.36, $p<0.05$) after adjusting for violence from other perpetrator groups in addition to covariates. We did not find evidence for an association between VL failure

and either physical violence or psychological abuse from a parent/caregiver or romantic partner.

No evidence of an association was observed for polyvictimization and VL failure (Table 12).

Table 12. Crude and adjusted associations between past-year violence victimization and viral load failure among adolescents and young adults living with HIV in Ndola, Zambia (n=272)

	Crude Odds Ratio	95%CI	P value	Adjusted Odds Ratio*	95%CI	P value
Any violence						
No violence	1			1		
Any physical, psychological, or forced sex	1.04	(0.59, 1.82)	0.89	1.09	(0.61, 1.95)	0.77
Frequency of any violence**						
No violence (scores of 0)	1			1		
Single act of violence (scores of 1)	0.72	(0.29, 1.80)	0.49	0.70	(0.28, 1.79)	0.46
Moderate frequency (scores of 2-11)	0.99	(0.55, 1.78)	0.97	1.06	(0.58, 1.96)	0.84
High frequency (scores of 12-42)	2.43	(0.87, 6.81)	0.09	3.58	(1.14, 11.27)	0.03
Type of violence						
Severity-times-frequency of physical violence**						
No violence (scores of 0)	1			1		
Single act of physical violence (scores of 1)	1.16	(0.54, 2.52)	0.70	1.08	(0.47, 2.47)	0.85
Moderate severity-times-frequency (scores of 2-7)	1.04	(0.55, 1.99)	0.90	0.93	(0.45, 1.93)	0.84
High severity-times-frequency (scores of 8-42)	1.52	(0.74, 3.14)	0.26	1.18	(0.49, 2.85)	0.71
Frequency of psychological abuse**						
No psychological abuse (scores of 0)	1			1		
Single act of psychological abuse (scores of 1)	0.83	(0.35, 1.96)	0.67	0.84	(0.34, 2.04)	0.70
Moderate frequency (scores of 2-5)	0.80	(0.45, 1.42)	0.46	0.81	(0.42, 1.57)	0.54
High frequency (scores of 6-18)	2.49	(1.12, 5.53)	0.03	3.32	(1.26, 8.70)	0.01
Forced sex						
No forced sex	1			1		
Any forced sex	1.31	(0.44, 3.88)	0.63	1.19	(0.35, 4.01)	0.78

Perpetrator of physical violence						
Any vs. none from a parent/caregiver	1.07	(0.54, 2.10)	0.85	0.95	(0.46, 1.96)	0.89
Any vs. none from another family member	2.27	(1.15, 4.51)	0.02	2.18	(1.05, 4.54)	0.04
Any vs. none from a romantic partner	0.56	(0.17, 1.77)	0.32	0.77	(0.21, 2.78)	0.69
Any vs. none from a friend/peer	2.4	(1.25, 4.62)	0.01	2.14	(1.05, 4.36)	0.04
Perpetrator of psychological abuse						
Any vs. none from a parent/caregiver	0.55	(0.25, 1.18)	0.12	0.48	(0.21, 1.09)	0.08
Any vs. none from another family member	2.09	(1.19, 3.67)	0.01	2.50	(1.37, 4.54)	0.003
Any vs. none from a romantic partner	0.85	(0.35, 2.06)	0.72	1.14	(0.42, 3.10)	0.80
Any vs. none from a friend/peer	1.19	(0.72, 1.99)	0.50	1.18	(0.68, 2.05)	0.55
Polyvictimization						
No violence	1			1		
1 type of violence	0.93	(0.49, 1.77)	0.82	0.98	(0.50, 1.90)	0.94
2 or 3 types of violence	1.14	(0.62, 2.12)	0.67	1.21	(0.63, 2.29)	0.57

*Adjusted for age, sex, and study clinic (a priori), and the following: mode of HIV acquisition (all models), time on ART treatment (all models), orphan hood (all models except for polyvictimization). Models for the type and perpetrator of violence adjusted for the other violence in addition to covariates. p values are Wald tests.

**Frequency of any violence scores were generated by summing each act's frequency (never-0, once-1, a few times-2, many times-3) across 14 acts of violence Severity-times-frequency of physical violence scores were generated by multiplying the act's severity level (moderate-1, severe-2) by its frequency (never-0, once-1, a few times-2, many times-3), and summing across 7 acts of physical violence. Frequency of psychological abuse scores were generated by summing each act's frequency (never-0, once-1, a few times-2, many times-3) across 6 acts of psychological abuse. Categories for violence scores were determined based on locally-weighted scatterplot smoothing (lowess) plots for the association between the variable and viral load failure.

No significant interaction by sex or age group was observed for any models. While these models found no significant interactions, we did observe differences when examining the results stratified by sex in post-hoc analyses (Table 13). The significant associations with VL failure for a high frequency of any violence, a high frequency of psychological abuse, and any versus no physical violence or psychological abuse from a family member other than a parent/caregiver were observed among male but not female AYA in sex-stratified adjusted models. The significant association with VL failure for any versus no physical violence from a friend/peer was observed among female but not male AYA in sex-stratified adjusted models. Among female AYA, we observed a significant adjusted association with VL failure for any versus no physical violence from a romantic partner in the adjusted OR only (aOR: 2.28, 95%CI: 1.03-5.04, p<0.05).

Table 13. Crude and adjusted associations between past-year violence victimization and viral load failure among adolescents and young adults living with HIV in Ndola, Zambia, stratified by sex (n=272)

	Males							Females						
	Total (n=111)	Crude Odds Ratio	95%CI	p value	Adjusted Odds Ratio*	95%CI	p value	Total (n=161)	Crude Odds Ratio	95%CI	p value	Adjusted Odds Ratio*	95%CI	p value
Any violence														
No violence	28 (25.2%)	1			1			44 (27.3%)	1			1		
Any physical, psychological, or forced sex	83 (74.8%)	2.01	(0.79, 5.08)	0.14	2.06	(0.76, 5.56)	0.16	117 (72.7%)	0.67	(0.33, 1.37)	0.27	0.69	(0.32, 1.48)	0.34
Frequency of any violence**														
No violence (scores of 0)	28 (25.2%)	1			1			44 (27.3%)	1			1		
Single act of violence (scores of 1)	12 (10.8%)	2.50	(0.60, 10.11)	0.20	2.22	(0.50, 9.78)	0.29	19 (11.8%)	0.27	(0.07, 1.07)	0.06	0.27	(0.06, 1.08)	0.06
Moderate frequency (scores of 2-11)	64 (57.7%)	1.60	(0.61, 4.20)	0.34	1.68	(0.59, 4.75)	0.33	86 (53.4%)	0.73	(0.34, 1.56)	0.42	0.82	(0.36, 1.86)	0.64
High frequency (scores of 12-42)	7 (6.3%)	15.00	(1.54, 145.22)	0.02	13.84	(1.36, 140.80)	0.03	12 (7.5%)	1.03	(0.28, 3.77)	0.96	1.40	(0.30, 6.50)	0.66
Type of violence														
Severity-times-frequency of physical violence**														
No violence (scores of 0)	60 (54.1%)	1			1			84 (52.1%)	1			1		
Single act of physical violence (scores of 1)	14 (12.6%)	2.88	(0.88, 9.46)	0.08	3.38	(0.85, 13.33)	0.08	20 (12.4%)	0.57	(0.19, 1.72)	0.32	0.53	(0.16, 1.78)	0.30
Moderate severity-times-frequency (scores of 2-7)	26 (23.4%)	1.58	(0.61, 4.09)	0.34	1.57	(0.46, 5.40)	0.47	30 (18.6%)	0.73	(0.30, 1.79)	0.49	0.67	(0.25, 1.83)	0.44
High severity-times-frequency (scores of 8-42)	11 (9.9%)	3.77	(0.98, 14.47)	0.05	2.61	(0.42, 16.06)	0.30	27 (16.8%)	1.01	(0.41, 2.47)	0.99	0.70	(0.23, 2.07)	0.52
Frequency of psychological abuse**														
No psychological abuse (scores of 0)	35 (31.5%)	1			1			61 (37.9%)	1			1		
Single act of psychological abuse (scores of 1)	10 (9.0%)	2.87	(0.68, 12.19)	0.15	4.58	(0.90, 23.40)	0.07	21 (13.0%)	0.39	(0.12, 1.30)	0.13	0.41	(0.11, 1.47)	0.17
Moderate frequency (scores of 2-5)	57 (51.4%)	0.96	(0.39, 2.33)	0.93	0.81	(0.27, 2.42)	0.71	54 (33.5%)	0.70	(0.32, 1.52)	0.36	0.91	(0.36, 2.27)	0.85
High frequency (scores of 6-18)	9 (8.1%)	15.33	(1.71, 137.40)	0.02	11.36	(0.99, 129.75)	0.05	25 (15.5%)	1.52	(0.60, 3.90)	0.38	2.47	(0.77, 7.91)	0.13
Forced sex														
No forced sex	106 (95.5%)	1			1			152 (94.4%)	1			1		
Any forced sex	5 (4.5%)	2.29	(0.37, 14.26)	0.38	1.48	(0.18, 11.86)	0.71	9 (5.6%)	0.96	(0.23, 4.00)	0.96	1.06	(0.21, 5.50)	0.94
Perpetrator of physical violence														
Any vs. none from a parent/caregiver	14 (12.6%)	1.55	(0.50, 4.78)	0.44	1.31	(0.38, 4.54)	0.67	28 (17.4%)	0.90	(0.38, 2.14)	0.80	0.79	(0.31, 2.02)	0.62
Any vs. none from another family member	13 (11.7%)	3.88	(1.11, 13.49)	0.03	6.09	(1.40, 26.39)	0.02	26 (16.2%)	1.93	(0.78, 4.29)	0.16	1.53	(0.61, 3.89)	0.37
Any vs. none from a romantic partner	0 (0.0%)	N/A	N/A	N/A	N/A	N/A	N/A	16 (9.9%)	0.61	(0.19, 2.00)	0.41	0.67	(0.17, 2.59)	0.56
Any vs. none from a friend/peer	29 (26.1%)	1.86	(0.79, 4.37)	0.16	1.47	(0.55, 3.91)	0.44	15 (9.3%)	3.26	(1.09, 9.70)	0.03	3.64	(1.08, 12.21)	0.04
Perpetrator of psychological abuse														
Any vs. none from a parent/caregiver	12 (10.8%)	0.45	(0.12, 1.78)	0.26	0.26	(0.59, 1.13)	0.07	27 (16.8%)	0.63	(0.25, 1.59)	0.33	0.96	(0.32, 2.89)	0.95
Any vs. none from another family member	29 (25.1%)	2.24	(0.95, 5.32)	0.07	3.42	(1.20, 9.72)	0.02	39 (24.2%)	1.97	(0.94, 4.12)	0.07	0.55	(0.19, 1.60)	0.27
Any vs. none from a romantic partner	2 (1.8%)	1.48	(0.09, 24.25)	0.78	0.76	(0.03, 20.70)	0.87	22 (13.7%)	0.88	(0.34, 2.32)	0.80	2.28	(1.03, 5.04)	0.04
Any vs. none from a friend/peer	53 (47.8%)	1.46	(0.68, 3.12)	0.33	1.57	(0.66, 3.76)	0.31	46 (28.6%)	0.91	(0.44, 1.88)	0.79	0.88	(0.40, 1.91)	0.74
Polyvictimization														
No violence	28 (25.2%)	1			1			44 (27.3%)	1			1		
1 type of violence	38 (34.2%)	1.46	(0.51, 4.18)	0.48	1.47	(0.48, 4.52)	0.51	55 (34.2%)	0.70	(0.31, 1.60)	0.40	0.74	(0.31, 1.79)	0.51
2 or 3 types of violence	45 (40.5%)	2.61	(0.95, 7.15)	0.06	2.69	(0.91, 7.87)	0.07	62 (38.5%)	0.64	(0.28, 1.43)	0.28	0.63	(0.26, 1.51)	0.30

*Adjusted for age, sex, and study clinic (a priori), and the following: mode of HIV acquisition (all models), time on ART treatment (all models), orphan hood (all models except for polyvictimization). Models for the type and perpetrator of violence adjusted for the other violence in addition to covariates. p values are Wald tests.

**Frequency of any violence scores were generated by summing each act's frequency (never-0, once-1, a few times-2, many times-3) across 14 acts of violence Severity-times-frequency of physical violence scores were generated by multiplying the act's severity level (moderate-1, severe-2) by its frequency (never-0, once-1, a few times-2, many times-3), and summing across 7 acts of physical violence. Frequency of psychological abuse scores were generated by summing each act's frequency (never-0, once-1, a few times-2, many times-3) across 6 acts of psychological abuse. Categories for violence scores were determined based on locally-weighted scatterplot smoothing (lowess) plots for the association between the variable and viral load failure.

5.5 Discussion

We found that past-year violence victimization among AYA living with HIV was associated with VL failure when the frequency, type and perpetrator of violence are considered. Importantly, while we found no associations for any violence victimization as a binary variable, the small proportion of AYA categorized as experiencing a high frequency of any victimization (7%) showed higher odds of VL failure. In South Africa, Cluver et al. found a similar pattern of increasing risk of ART non-adherence by additional violence exposure in a sample of 1,060 adolescents (10-19 years old).⁶ These results—including the lack of evidence for single acts or moderate frequency of violence—support the growing recognition of the need to consider cumulative effects of multiple types of violence on health outcomes^{112, 113} and specifically HIV outcomes.^{6, 106}

Our results demonstrate that experiencing a high frequency of psychological abuse was significantly associated with VL failure, independent of experiences of physical violence and forced sex. It may be that for the small proportion of AYA in this sample categorized as experiencing a high frequency of psychological abuse (12.5%), their experiences manifest in part as enacted HIV-stigma. Measures of HIV stigma among youth often include acts of verbal or emotional mistreatment,¹¹⁴ and qualitative studies have shed light on enacted HIV-stigma as a key concern facing AYA living with HIV in sub-Saharan Africa.^{115, 116} The effects of psychological abuse on AYA may be compounded by the developmental stage of adolescence, during which they develop the skills in managing their emotions, relating effectively with others, and feeling confident in their sense of self.¹⁵ This analysis did not assess whether the AYA believed the

psychological abuse they were experiencing was due to their HIV status. Further research is needed to understand the contexts in which psychological abuse occurs, the forms it takes, and how it affects HIV outcomes among AYA.

Other key findings concern the perpetrators of violence. We found that experience of physical violence and psychological abuse from a family member other than a parent or caregiver, as well as physical violence from a friend or peer, were independently associated with VL failure. Associations were strongest for psychological abuse from a family member other than a parent or caregiver. Echoing our findings for the association between VL failure and high frequency of psychological abuse, these results underscore the critical need for a deeper exploration of the meanings, drivers, and consequences of psychological abuse among HIV-positive AYA in sub-Saharan Africa. While the quality of family engagement has been recognized as affecting ART adherence among youth in the region,¹¹⁷⁻¹¹⁹ we need to better understand which family members perpetrate violence and what the nature of their relationships are with AYA living with HIV, including whether they live in the same household as the AYA. Additionally, some research has explored experiences of bullying among adolescents living with HIV in Malawi⁸ and South Africa,^{30, 120} but further insight into experiences of physical violence from friends and peers, and the extent to which such violence occurs in or around schools, could inform intervention strategies.

This study did not find statistical differences in the association between past-year violence victimization and VL failure by youths' sex, in contrast with findings from a study of perinatally-infected HIV-positive adolescents in the U.S. that found that recent indirect exposure to violence was related to unsuppressed VL in boys but not girls.¹⁰⁶ The

lack of differences in our study may reflect low power or contextual differences between AYA in Zambia and the U.S. Unlike previous studies in sub-Saharan Africa,^{6, 7} we also failed to find associations with VL failure for violence from a parent/caregiver or a romantic partner, which could reflect a lack of statistical power in our study.

While we did not find any statistically significant interaction by sex for the associations with VL failure, we observed several differences when stratifying our estimates by sex. Among males only, stratified adjusted analyses found that a high frequency of any violence, a high frequency of psychological abuse, and any versus no physical or sexual violence from a family member other than a parent/caregiver were significantly associated with VL failure. In contrast, female AYA showed higher odds of VL failure if reporting any versus no physical violence from a friend/peer or psychological abuse from a romantic partner in adjusted models. Given our relatively small sample size and the small proportions reporting these forms of violence, these findings demonstrate the need for more research into differences in the association between violence victimization and VL failure according to the youth's sex.

These findings have policy and programming implications. Although almost three-quarters of our sample experienced some form of past-year violence victimization, the small proportion of AYA who experience a high frequency of any violence, and psychological abuse specifically, may benefit most from a targeted intervention. HIV clinics could provide a useful setting to both identify AYA living with HIV who are at greatest risk of violence through screening for psychological abuse in addition to physical and sexual violence and providing support services.^{121, 122} The Zambian government has taken seriously the need to address gender-based violence, including through its passage

of one of the most comprehensive GBV acts on the continent.¹²³ This provides a strong foundation on which to build screening and response initiatives in HIV clinics and to ensure that such clinics have sufficient resources to properly respond to disclosures of violence.¹²⁴ Our findings also support the further design and testing of intervention initiatives which address violence in the home and among peers. Intervention efforts to engage caregivers in the health of AYA living with HIV are underway in the region¹²⁵ and could provide a useful platform to address violence from other family members. Moreover, while rigorous evaluation of school-based interventions in sub-Saharan Africa is still lacking,¹²⁶ reductions in peer violence have been observed following delivery of a school-wide intervention in Uganda.^{127, 128} Our findings on the association of peer-perpetrated physical violence suggest that further investment to address violence by peers, perhaps through school-based approaches, should be investigated to potentially prevent poor virologic outcomes among AYA living with HIV.

Some study limitations must be acknowledged. Our data were cross-sectional and hence, we are unable to draw conclusions about the temporal ordering of the violence victimization-viral load association. Although incomplete ART adherence is a primary means through which victimization may influence viral load, longitudinal studies could formally explore adherence as a mediator of the association and account for other possible mediators (e.g. depression, alcohol use). We did not measure the frequency of past-year violence from specific perpetrator groups since this would have required a much longer questionnaire, preventing a more nuanced understanding of our significant findings that family and friend/peer violence were associated with VL failure. Our relatively small sample size may have resulted in lower than desired precision and low

power for detecting interactions by sex and prevented us from formally testing for synergistic interactions across violence types,¹²⁹ though we still considered the frequency, severity, and multiple types of past-year violence exposure. Finally, since our population was sampled from HIV clinics, our findings may not be generalizable to youth living with HIV who are not in care.

5.6 Conclusions

Addressing violence may be critical to improving virologic outcomes and preventing the spread of HIV among AYA in sub-Saharan Africa. Policies and programs are needed to support AYA living with HIV who are experiencing violence, especially those experiencing high frequency of any violence, and a high frequency of psychological abuse. Data on perpetrators and types of violence will strengthen and allow targeted responses to AYA who are at increased likelihood of VL failure. Researchers should use longitudinal studies and qualitative methods to further explore pathways between violence victimization and virologic outcomes among both male and female youth living with HIV.

Chapter 6. “So hurt and broken”: A qualitative study of experiences of violence and HIV outcomes among adolescents and young adults living with HIV in Zambia

6.1 Abstract

Emerging data show associations between violence victimization and negative HIV outcomes among youth in sub-Saharan Africa. To more deeply understand this relationship, we conducted in-depth interviews with adolescents and young adults (AYA) living with HIV, ages 15-24, in Ndola, Zambia. We purposively selected 41 AYA (24 females, 17 males) with varied experiences of violence and virologic results. Analysis used thematic coding. Two-thirds of participants said violence affected their medication adherence, clinic attendance, and/or virologic results. They focused on the negative effects of psychological abuse in homes and schools, which was most salient, and sexual violence against females. In contrast, they typically depicted physical violence from caregivers and teachers as a standard discipline practice, with few impacts. Violence—especially verbal and emotional forms—must be recognized as a potential barrier to HIV self-management among AYA living with HIV and should be addressed in clinics, homes, and schools.

6.2 Introduction

Eighty-four percent of adolescents and young adults (AYA) living with HIV reside in sub-Saharan Africa.¹ Although important steps are being taken to reduce the HIV burden among this historically under-prioritized population,¹³⁰ AYA have lower levels of antiretroviral therapy (ART) adherence and viral suppression than adults.² In

Zambia, for example, only a third of AYA (aged 15-24 years) have achieved viral suppression compared to roughly three-fourths of older adults (aged 45-59 years).⁴⁹

Cross-sectional analyses of data from sub-Saharan Africa have identified a range of factors that are negatively associated with ART adherence among AYA. These include fear of unintentional disclosure and HIV stigma,^{117, 131} alcohol use,^{118, 132} depression,^{131, 132} and lack of a support system, including at home.^{117, 131, 132} Addressing these factors may help improve young people's HIV-related health outcomes and reduce HIV transmission. Recent studies have begun to identify violence from members of the home,^{6, 8} intimate partners,⁷ and caregivers, teachers, and clinicians⁶ as an additional factor associated with incomplete ART adherence among adolescents in the region. These findings align with a body of research among adult women living with HIV, which has demonstrated a relationship between intimate partner violence and incomplete ART adherence/viral load failure globally^{9, 10} and in sub-Saharan Africa.^{100, 101, 133}

Qualitative methods provide a critical approach for understanding the contexts in which violence occurs and the ways in which violence victimization relates to HIV outcomes. Although some qualitative studies have described youths' experiences of violence as a manifestation of HIV stigma^{115, 116, 134} or a typical occurrence at home or in school,^{115, 116} qualitative studies have yet to explore the intersection between experiences of violence and HIV outcomes among youth in the region. A deeper understanding of this relationship is particularly needed since adolescence and young adulthood represent a unique developmental stage.¹⁵

In prior analyses of baseline data from a randomized controlled trial among AYA living with HIV in Zambia, our team found a high prevalence of any past-year physical

violence, psychological abuse, or forced sex (72% male, 75% female); over a third experienced overlapping types of violence (39% male, 37% female). Among victims, the most common perpetrators included peers (74% male, 45% female), family members other than a parent/caregiver (41% both sexes), and parents/caregivers (18% male, 32% female). Furthermore, we identified significant associations between multiple types of past-year violence victimization and viral load failure.¹³⁵ The data presented here builds upon these previous findings to present results from in-depth interviews (IDIs) conducted with a sample of trial participants. Our aim was to explore the intersection between AYA experiences of violence victimization and their self-described HIV outcomes, including ART adherence, clinic attendance, and viral load failure.

6.3 *Methods*

Study population and procedures

We conducted one-time IDIs with participants from Project YES! (Youth Engaging for Success), a randomized controlled trial carried out in four HIV clinics in Ndola, Zambia (Clinical trial number: NCT04115813). The trial assessed the impact of a peer-mentoring intervention on viral suppression, ART treatment gaps, and feelings of self-stigma among 273 AYA living with HIV. Participants were eligible for the trial if they were aged 15-24 years, aware of their HIV status, a speaker of English or Bemba, on ART for at least 6 months, and available for study activities.

We purposively recruited 41 participants (24 females and 17 males) to achieve maximum variation according to AYA experiences of violence (moderate or severe), virologic results (viral load failure or not), sex (male or female), and age group (15-19 or

20-24 years). These characteristics were determined using the Project YES! baseline surveys. Classifications for the severity of violence drew on World Health Organization (WHO) definitions.¹³⁶ Viral load failure was defined as $\geq 1,000$ copies/mL.^{60, 61} AYA were only eligible for an IDI if they reported at least one act of violence victimization on the baseline survey.

Three Zambian interviewers, who had previous research experience with the study population, were hired and underwent nine days of training that drew on WHO ethical recommendations for violence research.⁷¹ This training covered the study goals and procedures, qualitative methods, interviewing techniques around violence, non-judgmental and confidential ways of collecting data on sensitive topics, and research ethics. Interviewers were matched with AYA informants by sex, and IDIs were conducted in English or Bemba at study clinics using a semi-structured guide.

At the start of the IDI, participants were told that they had been invited for an IDI because they had reported an experience of violence on the baseline survey. The interviewer began the IDI with questions about the participant's living situation and experiences living with HIV, prior to asking about the participant's experiences of violence. Rather than raising the specific acts the AYA had reported on the survey, the interviewer asked in turn about one or more times when the participant: 1) was hurt emotionally or mentally, 2) was physically hurt, or 3) was forced to do sexual things he/she did not want to do. For each type of violence raised, the interviewer gave probing examples (e.g. being insulted or humiliated, locked inside/outside the home) and followed up with a series of questions about how the experience(s) had affected the participant, including his/her HIV self-management (i.e. medication adherence,

appointment attendance, and/or virologic results learned during appointments). At the end of the IDI, participants were asked whether, and if so how, they would like the Project YES! program to help young people who have experienced the types of violence discussed during the IDI. IDIs lasted 45-90 minutes and were audio-recorded with permission, translated into English where needed, and transcribed.

Project YES! intervention

The Project YES! intervention consisted of monthly one-on-one and group meetings for AYA with a youth peer mentor, alongside three optional group meetings for caregivers, over six months. Trained and paid youth peer mentors, who were successfully managing their own HIV, addressed topics relevant to HIV self-management (e.g. stigma/discrimination, HIV disclosure). While violence was not a topic peer mentors were trained to address during their meetings with AYA, peer mentors were equipped with background knowledge about violence and trained to refer AYA to designated healthcare providers at clinics as needed, according to the study's safety protocol. All interviewees participated in at least one individual session with a peer mentor by the time of their IDI.

Data analysis

The interviewers and primary author wrote memos throughout data collection and analysis to capture reflections on the interview guide and methodological issues, interpret preliminary findings, document the research process,⁵⁵ and self-reflect on their roles in the research process.¹³⁷ Interviewers debriefed with the primary author individually after each IDI and collectively at regular increments to discuss challenges encountered,

emerging themes, and areas for further probing. The primary author conducted thematic coding, generating deductive codes based on the interview guide and adding inductive codes iteratively based on emergent themes.¹³⁸ Codes were applied to the text using NVivo 11.

Ethics

Informed consent for participation in study activities, including an IDI, was obtained from participants on enrollment in the trial. According to Zambian law,⁷⁰ parental consent and participant assent was obtained from minors (ages 15-17 years). Prior to the IDI, interviewers reminded participants of their consent to participate and their ability to stop the interview at any time. Participants who described severe experiences of violence or suicidal ideation were referred to healthcare providers at the clinic in line with the study's safety protocol. The ethics review boards at ERES Converge in Zambia and the Johns Hopkins Bloomberg School of Public Health, alongside the Zambia Ministry of Health through the National Health Research Authority, approved this research.

6.4 Results

About three-quarters of interviewees were aged 15-19, compared to aged 20-24, years. A similar proportion described themselves as perinatally-infected and as a single or double orphan. All participants discussed at least one experience of violence victimization during IDIs except one male, despite his multiple reports of violence on the baseline survey. Mirroring their baseline survey data, most youth in IDIs described experiences of psychological abuse while three-quarters described experiences of

physical violence. Only eight participants—all female but one —shared experiences of sexual violence. Half of these had not reported the act on the baseline survey, while nine interviewees (five males and four females) had reported but did not discuss acts of forced sex during IDIs.

Two-thirds of those who discussed experiences of violence described negative impacts that the violence had on their adherence to ART, clinic attendance, or virologic results. The four themes emerging from IDIs centered on the type rather than the severity of violence, a criterion used for maximum variation sampling. Themes included: the relationship between youths' HIV outcomes and their experiences of psychological abuse (theme 1), physical violence (theme 2), and sexual violence (theme 3); and preferences for addressing violence in the Project YES! intervention (theme 4).

Feeling “broken”: How psychological abuse at home and in school negatively influenced youths' HIV outcomes

The predominant theme across IDIs concerned youths' regular experiences of psychological abuse, mostly at home but also in school. This abuse made them feel “very bad,” “disturbed,” “angry,” “upset,” and “broken.” One participant, for instance, said of the verbal and emotional abuse from her step-mother, “It was hell. The treatment was not good.” These experiences did not differ for male and female AYA, or for AYA aged 15-19 versus 20-24 years. The most common perpetrators included step-parents (mostly step-mothers), parents, aunts/uncles, and peers, followed by grandparents, step-siblings, and siblings; a few AYA described abuse from in-laws and/or cousins. Almost three-quarters of those who had experienced psychological abuse described experiences from more than one perpetrator. Some AYA believed they were being targeted for violence

because of their HIV status. Almost twice as many, though, reported that they did not believe the violence was due to HIV specifically. Table 14 presents examples of psychological abuse experienced by AYA.

Table 14. Experiences of psychological abuse among adolescents and young adults (AYA) living with HIV in Ndola, Zambia, in their own words, distinguished by whether the AYA believed the abuse was related and unrelated to their HIV-positive status

Related to HIV-positive status based on self-report	Not related to HIV-positive status based on self-report
<p><i>"I don't like HIV positive people and I don't even want them near me. I don't want to share my things with them."</i> (Aunt to female participant)</p> <p><i>"You can't stay here because of your HIV status."</i> (Sister-in-law to female participant)</p> <p><i>"If you want to be eating, you should be cooking for yourself like that, and have your own plate."</i> (Female friend to female participant)</p> <p><i>"[You] should not be using some utensils because [you] will infect [your] siblings."</i> (Step-mother to male participant)</p> <p><i>"You should feel sorry for yourself. You know how you are."</i> (Aunt to female participant)</p> <p><i>"She is becoming a burden."</i> (Father to step-mother, overheard by female participant)</p> <p><i>"I am not the one who infected you with HIV... That's why your mom refuses to keep you."</i> (Step-mother to female participant)</p>	<p><i>"You should just die... We finding food for you and you are not contributing. It is better your elder brother, the one who died, if he was the one alive."</i> (Auntie to male participant)</p> <p><i>"Maybe you are not even you father's child... You, I doubt if you will complete school by grade nine. You will fall pregnant... You are a dog... You are a fool."</i> (Step-mother to female participant)</p> <p><i>"We did not leave some food for you... You can just stay like that. Today you won't eat."</i> (Female cousin to male participant)</p> <p><i>"Find some other place [to] stay.... This is not your mother's house. This is my house."</i> (Elder brother to male participant)</p> <p><i>You "child of a dog... mistake..."</i> (Female cousin to female participant)</p> <p><i>"She thinks we are related. We don't like her."</i> (Step-siblings with reference to female participant)</p> <p><i>"No, no, that child is a disobedient child. He is spoiled and one day, if I have a gun, I would be able to shoot him."</i> (Sister to mother, in front of male participant)</p> <p><i>"Go back to where [you] came from."</i> (Uncle to male participant)</p>

Half of those who experienced any psychological abuse described its harmful effects on their ability to manage their HIV. In nearly all of these cases, the AYA had also experienced physical violence but described the psychological abuse as having

harmed their HIV self-management. For example, a male participant described being regularly slapped and pinched by his grandfather, but pinpointed the regular verbal insults as spurring his refusal to take his medication:

I have been shouted at many times. I felt bad about it. An insult is more than beating you. When you get insulted, it gets to my heart. It's so emotional...When [grandfather] is angry, he would say, 'You monkey, you rat,' and then I would ask myself, 'Am I a rat? am I a monkey?' So I was like disturbed and I would ask myself, 'Why am being called such things?' He would even say that I should go to my mother's place...because, 'Am tired of you and don't even ask for money when you are going to school tomorrow'...It used to affect how I take my medication. I used to tell him that I would not take the medication when grandfather was angry with me. When he forced me, I used to put it in my mouth and go outside and spit.

While verbal abuse—referred to by many as “talking a lot”—was the most common form of psychological abuse described, experiences of controlling behaviors, especially the withholding of food, also affected HIV outcomes. A female participant described how being denied food by her uncle's wife influenced her medication regimen:

Her children have eaten. Me, I have not eaten. Just like that. She did not give me food...I used to tell my uncle and he used to think I was lying...I used to take [my drugs] but I felt dizzy because I didn't take any food.

Other controlling behaviors concerned access to ART. For example, a female participant's father prohibited her from starting ART, since he wanted her to use herbal remedies. Finally, a few AYA described being unable to pick up their medication from the clinic because of quarrels occurring among family members at home. A male participant, for instance, described witnessing periodic fights between his parents. When he would try to step in, his father would lock him out of the house, and he was forced to wait for the fighting to stop at his grandmother's house, which disrupted his clinic attendance.

Eight AYA described feeling depressed and/or having thoughts of suicide as a result of their experiences of psychological abuse, which also affected their adherence. A female participant described being forced to stay in her own room and use her own utensils when visiting her aunt. The verbal abuse she experienced provoked thoughts of suicide and missed medication:

Sometimes [my auntie] would say that, ‘No, you, you have already died. Don’t infect my children.’ She just used to use those words that are hurtful. When she starts talking, you just start crying... I had depression like that because of what she was saying... I used to reach a point where, it is better I just die ...Missing the [ART] drugs, I used to miss. When [my auntie] talks the same day, and it hurts me, then you will not take [the drugs] that same day... By that time the CD4 was 200, low...

A few AYA described instances when they had forgotten to take their medication because they had consumed alcohol as an immediate reaction to the abuse. Some responded to the abuse by refusing to eat, even if still taking their ART, which they learned during their clinical meetings was affecting the drugs’ efficacy.

While experiences of verbal abuse and mistreatment were most common at home, many AYA also feared or experienced psychological abuse from peers, especially at school. Several skipped their medication since they were afraid of being humiliated if their HIV statuses were revealed. A female participant attending boarding secondary school made the “mistake” of putting her medication in a locker, where a classmate discovered it and told her status to the rest of the school. The resulting psychological abuse from other students led to incomplete adherence and attempted suicide: “They were pointing fingers at me, so I started feeling out of place and started getting sick. [With my medication] I stopped... I attempted suicide twice at school.”

Beyond the home and school environments, a few female participants described effects on HIV outcomes of psychological abuse from their intimate partners. For instance, one participant's controlling partner prohibited her from having male friends and claimed that only he could accept her given her HIV status. She was "emotionally distressed" and regularly skipped her medication.

One-time experiences of verbal abuse were not generally perceived as impactful. Several AYA described, for example, experiencing verbal insults from strangers, but these experiences did not affect them "because in the first place, I don't know that person. It's like they have no value in my life." Similarly, psychological abuse from teachers, including being shouted at or forced to leave the classroom/kneel down, did not seem to significantly affect AYA since this was considered a standard form of punishment for misbehavior.

"It is just a normal thing": Youths' experiences of physical violence as discipline, unless accompanied by psychological abuse or sexual violence

Physical violence was most often described as a form of discipline from a caregiver or teacher and a means of "teaching...the way of life," which AYA did not consider to be related to their HIV status. Standard disciplinary practices included being hit with a ruler or duster on the hands or feet, threatened with a whip, slapped, or having an ear or arm twisted. AYA did not feel their management of their HIV was affected by these experiences because they considered the violence, even when severe, to be a "normal" consequence for doing something wrong. Two female participants explained:

When they find the class is making noise...the teacher will beat everyone...My class teacher, I used to think of him as my father, because I haven't grown up with

my father. So when he beats me, I just used to brush it off that he is just disciplining me. He is just teaching me to do the right way.

[Kicking, slapping], that happened several times. I even got used to that...[My grandma] hits you on the face, the back, wherever she feels like it even...She stoned me...on my hand...It is just a normal thing... No, I never used to skip my drugs, I just continued taking them.

Several AYA described experiencing severe physical violence which they considered unjustified, typically from someone at home. These AYA also experienced psychological abuse or sexual violence, and faced subsequent challenges with their HIV. Acts of severe physical violence included being kicked in the stomach, punched in the face, or hit with a chair or block, and at times led to injury, such as swelling and, for one participant, a broken nose. In each case, the physical violence was coupled with psychological abuse or sexual violence from the same perpetrator. One AYA, for instance, endured constant verbal and physical abuse from his parents, which led him to skip his medication, refuse to eat, and drink alcohol. He said, “They just want me to die at home.”

Although not a common theme, one female participant described skipping her medication and contemplating suicide when she would “overthink” about the potential of experiencing physical violence or homicide by a future partner if he was to learn her status: “I even used to refuse men who proposed, because eventually they would find out or I had to tell them [my status]. They can beat me or kill me.”

“It would be better if I just die”: Youth experiences of sexual violence

Of the seven female AYA who reported experiencing sexual violence, six experienced forced sex and five said the experience had led to their HIV acquisition when they were between 5 and 17 years old. All survivors of forced sex had undergone periods

of depression and suicidal ideation, and nearly all described challenges with medication adherence. A participant who self-described as perinatally-infected, for instance, was physically forced to have sexual intercourse multiple times over several years by her uncle. He threatened to kill her and stop paying her school fees if she told anyone. When she eventually told her aunt, the uncle denied it and her family blamed her for being promiscuous. Her family eventually reported the uncle to the police and he was placed in custody, only to be bailed out a few hours later. The participant described having suicidal thoughts and stopping her medication because her uncle had not been punished for what he had done:

[The experiences] even affected taking my medication. I just used to think that, ‘Ah, It would be better if I just die, instead of me taking this medication. It’s just—it’s not helping me.’ I used to skip a lot. Today I take my medication, tomorrow I don’t, just like that.

Only one male participant shared an experience of sexual violence. He reported forced sex on the baseline survey and described having been pressured to have sex with a young woman from his church, who told him that he should come by her house. He refused and confronted her the next time in church to tell her that he did not like her advances. She stopped attending church after that point. He did not describe any effects of this experience on his HIV self-management.

“How to stay safe in life”: Youth want violence addressed in clinic programming

When asked whether the Project YES! intervention should address violence as a topic within the curriculum for peer mentors, AYA resoundingly said “Yes.” Several saw potential benefits in discussing and learning about violence with their peer mentor during one-on-one or group sessions. They felt that such discussions would enable AYA to get

advice on how to handle situations of violence and help AYA realize that experiencing violence is common: “At least you get to know that you are not the only person that passes through problems” (male participant). AYA believed that these discussions could also encourage them “never to give up, no matter how somebody hurt them” (male participant).

Some AYA also wanted healthcare providers and parents to be involved in programming at clinics that address violence. One female AYA wished to have regular access to a trained counselor to discuss violence confidentially: “[Youth] are scared if they share, it will get out there in the community.” Another female participant expanded on this in requesting violence counseling as part of routine adherence meetings:

Here are so many that is struggling about how take their drugs, how to stay safe in life...But through this project they can learn a lot...They can be helped through counseling because most of them have not shared. [The violence] always hurts them....I would like the counseling to be done at the health facility...Just when that person comes for a review, at least they counsel the person so that they know their story.

A male AYA requested that the intervention address home environments “where there is a lot of quarreling.” He felt the caregiver meetings delivered as part of the Project YES! intervention offered a valuable opportunity to concurrently address violence, since the way that some of AYA are treated at home “is not okay.”

A couple of AYA thanked the interviewers for asking them about their experiences of violence. As a male participant elaborated, “You are the first person that have asked to talk about the hurtful experiences that I go through in my life.”

6.5 Discussion

Our findings demonstrate the critical need to recognize psychological abuse in the form of verbal insults, emotional mistreatment, and controlling behaviors as a potential barrier to positive HIV outcomes among both male and female AYA. AYA poignantly described these forms of maltreatment as a common occurrence with detrimental effects on their HIV self-management practices and their mental health. These findings echo our quantitative analyses of baseline trial data, in which we observed associations between a high frequency of past-year psychological abuse and VL failure, adjusting for physical and sexual violence and covariates (adjusted odds ratio: 3.32; 95%CI: 1.26-8.70).¹³⁵

Importantly, the effect of violence on HIV outcomes differed notably depending on the type of violence experienced. We found that the small number of female AYA who experienced sexual violence also described harmful effects on HIV outcomes, in line with research conducted among adult women living with HIV.^{9, 10} These effects were primarily seen through feelings of depression and suicidal ideation, which often co-occur with experiences of violence among AYA living with HIV in the region.^{30, 31, 139} By contrast, AYA primarily depicted both moderate and severe forms of physical violence from caregivers and teachers as disciplinary practices, consistent with results from a study with adolescents aged 10-17 years in South Africa.¹⁴⁰ In light of the high co-occurrence of physical violence with psychological abuse in our sample, we must note that the AYA may not recognize the harmful effects of the physical violence on their bodies and psyche—particularly when the psychological abuse engenders fear. However, in our sample, AYA did not describe such physical discipline practices as affecting them or their HIV self-management practices. Taken together, these findings add a strong

voice to the recent calls in the literature for greater attention to the health effects of psychological and emotional violence, especially in combination with physical violence, beyond the traditional focus on physical and sexual violence alone.^{83, 93, 141, 142}

Our findings also add important insight into the areas of both conceptual overlap and distinction between experiences of psychological abuse and enacted HIV stigma. Some AYA described their experiences of verbal abuse—especially from peers—in terms of enacted HIV stigma and discussed negative effects on their HIV self-management. These findings reinforce existing literature on enacted HIV stigma as a key challenge facing youth living with HIV in the region.^{115, 116, 143} A growing body of research among youth from sub-Saharan Africa shows that experiences of HIV stigma are associated with mental health difficulties,^{31, 120, 144} which are risk factors for ART non-adherence.^{31, 132} However, twice as many AYA said that the verbal abuse and emotional maltreatment they were experiencing was unrelated to their HIV status but still negatively affected their HIV care and treatment practices. These findings demonstrate the importance of continuing to assess the relationship between enacted HIV stigma and HIV outcomes, but also highlight the need to examine psychological abuse as a distinct concept. Focusing on enacted HIV stigma alone will provide an incomplete picture of how verbal and emotional forms of mistreatment affect HIV outcomes among AYA.

Repeated insults and other forms of verbal abuse were especially prominent in the home, supporting research on the key roles that families and home environments play in youths' health and ART adherence.^{30, 115, 117, 131, 134} The home is often the primary setting where youth manage their HIV¹¹⁷ but can exacerbate the challenges of living with HIV. Some youth, for instance, lack supportive relationships or are given less food than others

at home.^{30, 117, 131, 143} A few qualitative studies have described youths' feelings of depression or distress stemming from verbal abuse by family members at home.^{115, 116} Importantly, our research extends these findings by revealing the negative effects of these chronic insults and abuse, not only on youths' general wellbeing, but also their ART adherence and virologic results. Some forms of emotional maltreatment the AYA described, such as being denied food and being made to feel unimportant in their homes, could be considered forms of neglect.¹⁴⁵ A few AYA also described having witnessed IPV alongside being abused themselves, which has been identified as a risk factor for HIV.¹⁴⁶ These forms of violence merit additional exploration, since they were not the focus of the current study.

AYA in our study expressed an overwhelming desire for verbal abuse and emotional maltreatment, alongside physical and sexual violence, to be addressed in clinical settings. They highlighted value in discussing such experiences with a peer mentor to help AYA recognize that many forms of violence are common and to learn about ways of navigating experiences of victimization. We must note that although the peer mentors in Project YES! were trained to refer AYA to healthcare providers for experiences of violence, they were not trained as counselors. Nevertheless, these findings offer a call to action for further testing of peer-mentoring approaches, which have shown promise in supporting ART adherence in clinic settings^{147, 148} and increasing awareness about violence services among AYA outside the clinic.¹⁴⁹ The Zambian government has taken important steps to address sexual and gender-based violence,¹⁵⁰ building on its passage in 2011 of the continent's most comprehensive act on gender-based violence.¹²³ While our findings support increasing access to these forms of services among AYA,

they also highlight the need for further investment into clinic-based initiatives which help AYA cope with the psychosocial challenges they face, such as verbal abuse, unhealthy relationships, stigma, and family dynamics.¹⁴⁸ Screening for experiences of psychological abuse, in addition to physical and sexual violence, could help to identify and link to care AYA who are at greatest risk of violence and incomplete ART adherence. In line with the desires of AYA in this study, counselling on topics of verbal abuse in addition to physical/sexual violence could be integrated into routine adherence meetings. These initiatives would go a long way in moving beyond the traditional focus on physical and sexual violence to address the harmful effects of verbal and emotional forms of abuse.

It is also important to further test home- and school-based interventions to reduce levels of verbal abuse, mistreatment, and sexual violence, given that these were the primary settings where AYA in our sample described violence as it relates to their HIV outcomes. Schools have been identified as key settings for delivering HIV education to youth¹⁴⁷ and one intervention in Uganda has successfully reduced levels of school violence within general populations of youth.¹²⁸ We recommend delivering anti-violence messaging to students, regardless of their HIV status, which addresses emotional in addition to physical and sexual forms of violence to students. Home-based interventions could integrate similar messaging into existing programs which target the primary caregivers of AYA living with HIV.¹²⁵ Approaches seeking to reduce violence at the community level—for instance, through community mobilization interventions like SASA!¹⁵¹—may also be useful for engaging hard-to-reach household members who perpetrate violence and for changing norms around violence, which could help reduce its prevalence.¹⁵²

Several study limitations should be noted. AYA in this sample were attending HIV clinics in urban settings, and most self-described themselves as perinatally-infected. This may limit the transferability of findings to AYA who are not in care, who live in rural settings, or who have acquired HIV through other means. However, purposive stratified sampling allowed us to include a variety of experiences with violence and viral loads, strengthening the transferability of our findings to AYA with similar characteristics in Zambia and regionally.

6.6 Conclusion

This study offers novel findings on experiences of violence victimization—particularly verbal and emotional forms of abuse—and their deleterious impacts on HIV outcomes among AYA living with HIV in Ndola, Zambia. This is an area which has yet to be fully explored in qualitative studies and is only beginning to gain attention in quantitative studies in the region.⁶⁻⁸ Our findings should inform policy and practice in HIV clinics, alongside home- and school-based interventions. Future research should expand on our findings to strengthen our understanding of how the relationship between violence and HIV outcomes varies according to the type of violence among both male and female AYA living with HIV in other settings in Zambia and throughout sub-Saharan Africa. Such research is critical to improving virologic outcomes, reducing onward transmission of HIV, and meeting the needs of this at-risk but resilient population.

Chapter 7. Discussion

7.1 *Summary of findings*

Data presented in this dissertation provide critical insight into experiences of violence victimization and their relationship with VL failure among AYA living with HIV in Zambia. This chapter begins with a summary of six key findings, which are the outcome of the triangulation of results from Aims 1 through 3.

The burden of violence victimization is high among AYA living with HIV in Zambia. Weighted estimates from Aim 1 analyses indicate that nearly three-quarters of this population has experienced any psychological abuse, physical violence, or forced sex in the past year (72.0% among males, 74.5% among females). These experiences of violence are often overlapping, with over a third (37.8%) of AYA having experienced polyvictimization in the past year. While the prevalence of any violence and of the types of violence did not differ by sex, we identified significant differences in the perpetrators of past-year violence against AYA who report violence: males experienced more violence than females from a friend/peer (74.3% versus 45.1%); females experienced more violence than males from a romantic partner (33.3% vs. 5.0%), parent/caregiver (32.4% vs. 17.6%), and stranger (19.7% vs. 5.2%). These findings are of concern given the health consequences of violence, discussed further in Chapter 8. Our findings also demonstrate the importance of measuring and disaggregating estimates of violence victimization across perpetrator groups according to youths' biological sex, which has not been done consistently in previous studies on the topic from SSA.^{6, 8, 30, 31}

Experiences of violence victimization are related to VL failure among AYA living with HIV in Ndola. In our Aim 2 quantitative analyses, we found statistically significant associations between VL failure and multiple modalities of past-year violence victimization, including a high frequency of any violence and a high frequency of psychological abuse. Physical violence and psychological abuse from a family member other than a parent/caregiver, and physical violence from a friend/peer, were also significantly related to VL failure. These results were echoed in the Aim 3 qualitative interviews in which about two-thirds of the AYA who experienced violence described negative impacts on their HIV outcomes by impacting their adherence to medication and clinic attendance. These findings provide evidence that violence has detrimental effects on HIV outcomes and the need to address violence to improve health outcomes and reduce HIV transmission among AYA in SSA.

Importantly, in our quantitative Aim 2 analyses, we did not find evidence of an association with VL failure when comparing AYA who experienced any violence to those who did not. Associations were only observed for VL failure and a high frequency of any violence versus no violence, where high frequency was defined as having a score of 12-42 on a scale of 0 (no frequency) to 42 (highest possible frequency) (aOR: 3.58, 95%CI: 1.14-11.27, $p < 0.05$). These findings were echoed during the Aim 3 qualitative interviews. Although we did not probe into differences in HIV outcomes according to the frequency of violence, we did learn that one-time experiences of psychological abuse (e.g. from a stranger) were not considered impactful. These findings show the value of examining the cumulative effects of multiple types of violence on health outcomes. They also support evidence for the cumulative effects of violence on incomplete ART

adherence provided by Cluver et al. in their cross-sectional study among South African adolescents.⁶

Psychological abuse is the most salient form of violence in the lives of these AYA and has particularly detrimental effects on HIV outcomes. The Aim 1 quantitative analyses revealed that the weighted prevalence of past-year violence was highest for psychological abuse (65.3%), followed by physical violence (44.7%) and forced sex (4.7%). Building on these results, in Aim 2, we found independent associations between a high frequency of psychological abuse and VL failure, adjusting for physical and sexual violence alongside covariates (aOR: 3.32, 95%CI: 1.26-8.70, $p < 0.01$), where high frequency of psychological abuse was defined as scores of 6 to 18 on a scale from 0 (no frequency) to 18 (highest possible frequency). Furthermore, in Aim 3 IDIs, psychological abuse—manifested through verbal insults, emotional mistreatment, and controlling behaviors—emerged as the predominant type of violence discussed by AYA and was pinpointed as the form of violence that most affects HIV outcomes. This theme was prominent even among AYA who were experiencing both psychological abuse and physical violence. In such cases AYA often described the physical violence as “normal” form of discipline, whereas they described the psychological abuse as cutting to the heart, causing an invisible pain that prevented them from taking their medication. Some said they felt depressed or had suicidal thoughts following their experiences of psychological abuse. These findings should inform future violence research and programming for AYA living with HIV. They highlight the critical importance of measuring and assessing psychological abuse, rather than focusing on physical and sexual violence alone.^{83, 93, 141, 142}

Violence from family members in the home is also prominent and negatively affects youths' HIV outcomes. In Aim 1, we found that, almost one-third (31.0%) of AYA experienced past-year violence from a family member other than a parent/caregiver, and 20.4% experienced past-year violence from a parent/caregiver. Aim 2 demonstrated associations between both psychological abuse (aOR: 2.50, 95%CI: 1.37-4.54, $p<0.01$) and physical violence (aOR: 2.18, 95%CI: 1.05-4.54, $p<0.05$) from a family member other than a caregiver with VL failure in adjusted analyses. Furthermore, in Aim 3, the negative effects of violence—especially psychological abuse and in some cases sexual violence—on HIV outcomes were most often discussed within the context of the household. IDIs revealed the vulnerability of these AYA—three-quarters of whom are single or double orphans—to verbal insults and other forms of emotional hostility from step-parents, parents, aunts/uncles, grandparents, and siblings, among others. Previous studies have taken important steps in shedding light on the critical role of the home environment in the success of youths' HIV outcomes.^{30, 115, 117, 131, 134} Our findings add to this literature by showing violence as an additional factor influencing VL.

Our findings also raise an important consideration regarding the conceptual areas of overlap and distinction between measures of psychological abuse and enacted HIV stigma. In Aim 3, while some AYA believed they were being targeted with mistreatment because of their HIV status, many described skipping their ART because of verbal insults and other forms of emotional mistreatment which they considered to be unrelated to their HIV. Qualitative studies of HIV stigma among AYA living with HIV in SSA have described experiences of emotional violence,^{115, 116} and quantitative measures of HIV stigma often include acts of verbal or physical abuse (e.g. “I have been teased because of

my HIV status”).¹¹⁴ Our results demonstrate the need to take a broader view and examine other forms of psychological abuse which may not fall under the construct of enacted HIV stigma.

Peer violence is highly prevalent and is related to undesired HIV outcomes.

Three out of every four males and almost half of all females experienced past-year violence from peers. In adjusted analyses, Aim 2 found that youth who experienced past-year physical violence from a peer were twice as likely to experience VL failure as their peers who did not experience this form of violence from a peer (aOR: 2.14, 95%CI: 1.05-4.36, $p<0.05$). The relationship between peer violence and HIV outcomes was expanded upon in Aim 3, although participants focused on the effects of emotional and verbal forms of abuse rather than physical violence. In Aim 3, AYA most often described a negative relationship with mistreatment in schools, especially boarding schools, which affected their HIV management. These findings reflect the cognitive and psychosocial changes AYA undergo, which lead them exhibit to a heightened concern for the opinions of their peers.³⁸ They reinforce the importance of a youth-centered approach to researching the relationship between violence victimization and HIV outcomes.

7.2 A return to the study’s theoretical orientation and conceptual framework

This study’s grounding in a socio-ecological framework was valuable, both in framing the design of our study and measurement tools and informing our study implications. It allowed us to consider program and policy responses cutting across multiple levels, which are presented in Chapter 8. Through this research, we also gained an awareness of theories of cumulative trauma and stress. These theories may prove

valuable in future studies on the topic, since we found many AYA living with HIV are experiencing overlapping types of violence and some at a high frequency.

Cumulative trauma theory emphasizes the relationship between the severity and frequency of victimization and negative health outcomes. It posits a linear association between the number of types of traumatic events and the severity of clinical impairments.¹⁵³ Studies have demonstrated associations between increasing numbers of types of traumatic victimizations and undesired health outcomes,¹⁵⁴⁻¹⁵⁷ including through a dose-response relationship.¹⁵⁸ The theory considers the health effects of both exposure to multiple forms of interpersonal trauma and frequent exposure to a single form of trauma.¹⁵³ This was indeed a strategy employed in this dissertation; we looked at polyvictimization and the frequency of multiple types of violence, in addition to the frequency and/or severity of specific types of violence (i.e. physical violence and psychological abuse), as they related to VL failure. However, articulating the theory behind such an approach early on in future studies could strengthen the analytical strategy and situate the strategy within a broader body of literature.

Stress theories are also of value in highlighting the physiological effects on the body of multiple experiences of violence accumulating over time. Toxic stress theory, as one example, posits that early experiences of stress create vulnerability to future stressors, that chronic stress produces physiologic disruptions or biological memories that negatively impact the body's stress response systems, and that these disruptions can persist into adulthood.¹⁵⁹ Stress theories have been used in studies of the intersection between violence and HIV, for instance, to understand the pathways through which exposure to violence may lead to enhanced HIV susceptibility in the female reproductive

tract.^{160, 161} As depicted in our conceptual framework, this dissertation concerned itself with the effects of violence on HIV outcomes. Future studies of this relationship may benefit from drawing on stress theories to directly consider physiologic, psychological, and other behavioral factors that lie on the pathway between violence victimization and VL failure among AYA living with HIV.

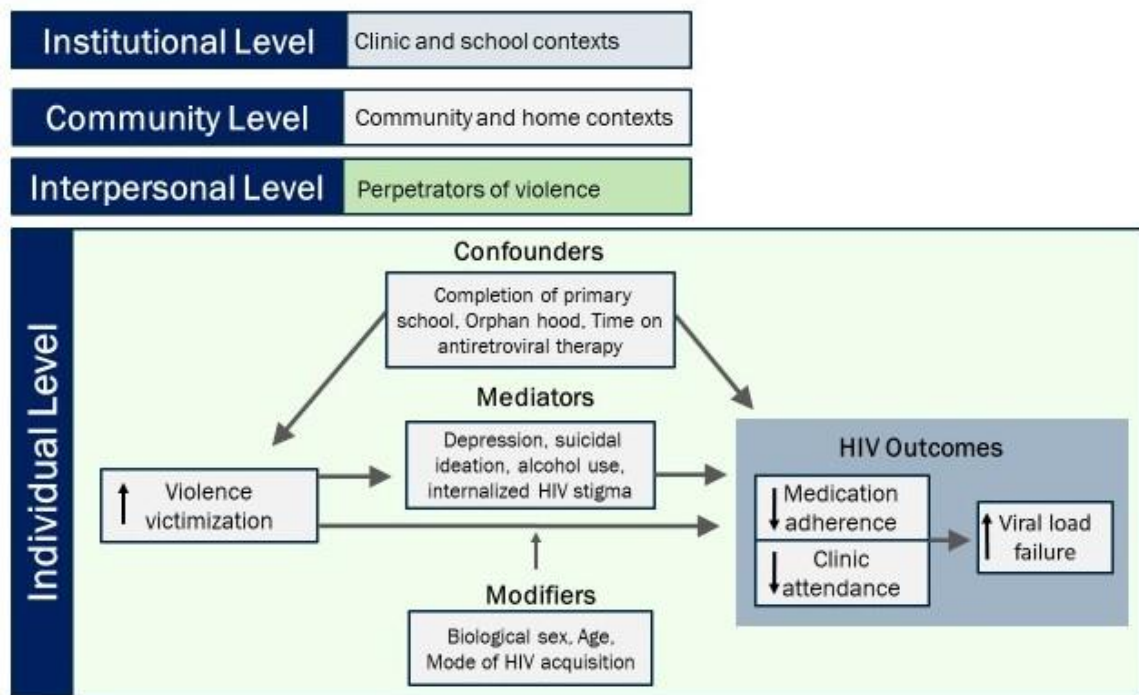


Figure 9. Revised conceptual framework for the association between violence victimization and viral load failure among adolescents and young adults living with HIV in Zambia

Based on the data collected in this dissertation, we present a revised version of our conceptual framework to guide future studies (Figure 9). At the individual level, this study's use of cross-sectional data prevented assessment of potential mediators of the relationship between violence victimization and virologic failure. However, our qualitative findings raise several potential mediators which should be further explored.

Several participants described feelings of depression, suicidal ideation, and alcohol use as resulting from their experiences of violence and, in turn, affecting their HIV outcomes. Feelings of depression^{162, 163} and alcohol use^{164,165} have indeed been shown to result from experiences of violence in some settings, and have been associated with undesired HIV outcomes among adolescents in SSA.^{31, 139,8} While experiences of violence may be a manifestation of enacted HIV stigma, internalized HIV stigma could also lie on the causal pathway between violence victimization and virologic failure. Internalized HIV stigma is a recognized barrier to positive HIV care and treatment outcomes¹⁶⁶ and has been hypothesized as an outcome of violence victimization among AYA in SSA.¹²⁰

We further note the potential moderating effects of the mode of HIV infection, which we treated as an adjustment variable. The relationship between violence victimization and VL failure, and those variables along the causal pathway, may differ for those who have acquired HIV perinatally, through consensual sex, or through forced sex. Five out of eight female AYA described having acquired HIV through forced sex during IDIs, but we did not directly measure this in Aim 2. A key theme among these five interviewees was their feelings of depression and thoughts of suicide, which many said had affected their HIV self-management. The pathway between violence victimization, depression, and VL failure may thus be particularly strong among AYA who have acquired HIV through forced sex. Further research is needed into the mode of HIV infection as an effect modifier of the association between violence victimization and VL failure among AYA.

At the interpersonal level, our findings showed the importance of considering experiences of violence from multiple perpetrator groups—particularly family members

other than a parent/caregiver and friends/peers—beyond the traditional focus on intimate partners. At the community and institutional levels, we gained some insight into the school and community as well as school and clinic settings in which AYA experience violence and manage their HIV. While our research reinforces the relevance of these levels to the relationship between violence victimization and virologic failure, further investigation is needed into the specific variables that ought to be included in future analyses.

7.3 Strengths and limitations

This section builds upon the methodological strengths and limitations raised within Chapters 4-6. The mixed-methods design is one of the study's greatest strengths, enabling us to both quantify the intersection between violence and VL failure and explore how it manifests in the lives of the AYA. Using both types of data helped to minimize each method's limitations. For instance, in Aims 1 and 2, we did not ask AYA about the extent to which they believed their experiences of violence resulted from their HIV status, but we were able to delve into the youths' views on this question during the Aim 3 interviews. The result was a more nuanced set of data, which can inform policy and practice for AYA living with HIV in Zambia and regionally.

The quantitative and qualitative data also had strengths independent of one another. A strength of our quantitative data (Aims 1 and 2) was the use of rigorous measures, including the biological outcome of VL failure. In accordance with gold standard practice, violence victimization was assessed using self-reports of multiple behaviorally-specific acts of victimization (e.g. being slapped or hit), rather than “loaded terms” such as “abuse,” “rape,” or “violence.”⁷¹ We also examined multiple types of lifetime and

past-year violence victimization from a range of 12 possible perpetrator groups, and accounted for the frequency and severity of violence in line with cumulative trauma theory. A strength of our qualitative data (Aim 3) was the use of memos, reflexivity, and frequent debriefing with interviewers, which enhanced the credibility and dependability of our findings.⁵⁵

Finally, a study strength is our careful consideration of ethical concerns and our development of a safety protocol to refer AYA to healthcare providers as needed. The importance of upholding ethical principles when researching sensitive topics within at-risk populations cannot be overstated. While our experiences implementing the study's safety protocol did not form part of this dissertation, they played an essential role in underpinning the research and will be presented as an independent manuscript.

Several limitations must be recognized. The relatively small study sample for our quantitative analyses (Aims 1 and 2) may have resulted in less than desired precision for our estimates. AYA study participants attended HIV clinics, lived in an urban environment, mostly reported having acquired HIV perinatally, and were primarily single. Hence, our findings may not fully transfer to AYA living with HIV who are not in care, do not live in urban settings, have acquired HIV through other means, and are married. However, many of the lived realities of AYA in this study are comparable to other low-resource settings in sub-Saharan Africa and findings can thus prove useful beyond Ndola. An additional limitation centers on social desirability bias, where we observed instances of under-reporting of sexual violence among female AYA on the baseline survey. Social desirability, and the stigma associated with males experiencing sexual violence, may have also led to the lack of discussion about these experiences in

IDIs among males. Both violence and HIV are stigmatized issues in Zambia, which can affect the degree to which AYA feel comfortable reporting on their experiences. Data collection was also carried out at clinics, which may have made AYA reluctant to disclose certain forms of violence (e.g. from a healthcare provider). We sought to minimize under-reporting and encourage open conversation, however, through the careful design of our questionnaires and interview guides, and the intentional selection and training of our Zambian data collectors and pretesting of study instruments.

Chapter 8. Study implications

This chapter begins with recommendations for future research. It then discusses study implications for AYA living with HIV at the individual level. Moving to higher levels of the socio-ecological framework, the chapter concludes by proposing two broad strategies for addressing the negative relationship between violence victimization and virologic outcomes among AYA living with HIV.

8.1 Recommendations for future research

This dissertation points to six key areas for future research. First, more quality data—both quantitative and qualitative—on **experiences of psychological abuse** among AYA living with HIV in SSA is needed. Studies of violence have historically prioritized physical and sexual violence alone, rather than addressing verbal and other emotional forms of violence.^{83, 84} Some researchers have highlighted, however, that these forms of abuse can have more harmful consequences than physical or sexual violence and have called for a greater focus on their effects.^{83, 93, 141, 142} Our data support these calls in the literature by demonstrating the negative relationship between frequent experiences of psychological abuse and HIV outcomes among AYA living with HIV.

Researchers have highlighted challenges associated with measuring psychological abuse. Experiences of this form of violence are likely to differ from person to person.¹⁶⁷ It is thought to encompass a range of acts (e.g. controlling and coercive behavior, threats, insults, etc.) that are difficult to define¹⁶⁷ when compared to physical or sexual violence. Psychological abuse does not leave visible traces from an aggressor, in contrast with physical and sexual violence.¹⁶⁸ Of note, many researchers believe that there are

gradations of psychological abuse that might not be particularly harmful.¹⁶⁹ Hence, there have been calls in the literature to clarify the threshold for what constitutes a case of psychological abuse.^{83, 84, 93} Indeed, we found associations between psychological abuse and virologic failure only among AYA experiencing a high frequency of this form of violence. While important investigations are underway into thresholds for what constitutes psychological abuse against women from an intimate partner,⁸⁴ our findings highlight the need for similar efforts in examining psychological abuse from a range of perpetrator types against both male and female AYA.

Second, alongside investigation into experiences of psychological abuse, there is a need for further assessment of **overlapping experiences of psychological abuse, physical violence, and sexual violence as they relate to virologic failure** among AYA in SSA. In Aim 2, we examined the independent associations between these types of violence and virologic failure in an effort to identify whether any one type would show an association after adjusting for the other types. We found independent associations for a high frequency of psychological abuse, which is valuable for informing intervention strategies and areas of future research. However, we must also recognize that types of violence are not experienced in isolation. Almost half of victims of violence in this sample experienced more than one type of violence. In Aim 2, we found that about two-thirds of those who reported a high frequency of psychological abuse in the past year also reported a high frequency of physical violence and/or any forced sex in the past year. Furthermore, in Aim 3, the vast majority AYA who described effects of psychological abuse on their HIV management were also experiencing physical violence and some sexual violence. We did not identify associations between polyvictimization and

virologic failure in Aim 2, but we note that the limitations associated with our sexual violence measures may have led to an under-estimate of the prevalence of this form of violence. This may have also contributed to the null finding for polyvictimization. Moreover, the proportion of our sample responding “yes” to experiences of forced sex was too small to facilitate an examination of clusters of violence (e.g. psychological abuse and forced sex, physical violence and forced sex) as they relate to virologic failure—an approach that has been taking in some studies of intimate partner violence and HIV.^{93, 170} Ultimately, more research is needed into the extent to which associations with HIV outcomes are driven primarily by one or more type of violence, or whether the overlap in experiences of violence is most important, for AYA in SSA.

Third, our findings suggest a need for additional research into **experiences of sexual violence** among both male and female AYA living with HIV in the region. In our quantitative analyses (Aims 1 and 2), we only included one out of four questionnaire items on sexual violence in Aims 1 and 2 out of concern that the non-consensual nature of the acts was unclear for the excluded measures. These items asked if anyone “made you watch a sex video or look at sexual pictures,” “made you look at their private parts or wanted to look at yours,” or “touched your private parts in a sexual way, or made you touch theirs.” These three ICAST-C measures were developed for use with children ages 11 to 18,⁵⁹ which is an age group likely to include both children who are not sexually active and adolescents who are engaged in sexual activities. Other researchers have noted that young people may not interpret being “made” to do something as an act of coercion.⁹⁵ The unclear wording used for these items may be compounded by translational difficulties, even though our team translated the items into Bemba and

piloted the items among youth in Ndola. When referred to healthcare providers for their reported experiences on the baseline survey through the Project YES! safety protocol, some AYA—particularly older AYA—described consensual acts rather than acts of violence to the provider. The ICAST-C was developed with input from scientists across 40 countries (including in SSA), has undergone piloting and reliability testing, and is currently available in six languages.¹⁴⁵ Our experiences, however, highlight the critical need for further testing and development of the sexual violence measures of the ICAST-C tool, with particular attention given to testing among adolescents (aged 15-18 years). Additionally, we used this tool within our sample of AYA ages 15-24 years, despite its design for AYA ages 11-18 years. We therefore recommend that researchers conduct further testing of the tool prior to using it among young adults, up to age 24 years, in future studies.

Another challenge with measuring sexual violence relates to social desirability bias. Of eight interviewees (all female but one) who described experiences of sexual violence during the IDIs, half (all female) had not reported the act on the baseline survey. Some may not have felt comfortable disclosing such a highly stigmatized experience to a RA during the baseline survey, despite our efforts to avoid under-reporting through deliberate training of study staff and careful design of the violence questions.

Social desirability may have also limited the willingness of males to discuss in detail their experiences of forced sex during IDIs. Only one male out of six who participated in an IDI and had reported forced sex during the baseline survey discussed his experience of sexual violence. This male shared how he had been pressured to have sex. The sexual act itself did not take place, but the participant reported forced sex on the

baseline survey. It might be that the male participant mis-understood that the survey question referred to a completed act of sexual intercourse, or that the participant responded “Yes” to an experience of forced sex because he did not feel that any of the other sexual violence questionnaire items captured his experience. While this situation was only found for one participant, this finding highlights how social desirability could vary by research method and the sex of the participant. Taken together, these findings underscore the complexity around reporting experiences of sexual violence and the need for further research into this area among both male and female AYA living with HIV.

Fourth, we highlight the need for a greater understanding of **peer violence** in the lives of AYA living with HIV. In Aim 1, we found a high prevalence of peer violence, and in Aim 2, we identified associations between physical peer violence and VL failure. In Aim 3, however, interviewees focused on the impact of psychological abuse rather than physical violence from peers on their management of their HIV. Those who experienced physical violence from peers did not link these experiences with their HIV outcomes. Furthermore, during IDIs, AYA primarily discussed peer violence within the school context, with only a few describing peer violence occurring outside of school. These data demonstrate value in more deeply examining the forms and contexts of peer violence, both in and out of school settings, to inform the design of appropriate interventions.

Fifth, future studies on violence as it relates to HIV outcomes must **include male in addition to female AYA**. We found high levels of violence against both male and female AYA in Aim 1. The themes emerging in our Aim 3 qualitative analysis did not differ for males compared to females, with the exception of experiences of sexual violence which

were predominantly described by female AYA. In our Aim 2 analyses, however, while we did not observe evidence of statistical interaction by sex in the association between violence victimization and VL failure, we observed differences when stratifying the associations by sex. In particular, we found several associations between violence victimization and VL failure for males which were not significant among females. While previous studies that have measured violence against children and adolescents living with HIV in SSA have included both sexes,^{6-8, 30, 31} we are unaware of studies which have looked at experiences of violence victimization among young men living with HIV. Our findings highlight the need to broaden the target populations of future studies to ensure that the experiences of violence against these young men are captured. Given our relatively small sample size for stratified estimates in Aim 2, it is particularly important that future researchers expand on our findings among both male and female AYA living with HIV.

Finally, **longitudinal data** are needed to examine the temporality of the violence victimization-VL failure association and to clarify mediating variables, as discussed in Chapter 7 in our updated conceptual framework. While we gleaned some understanding of temporality during Aim 3, formal investigations are critical to strengthening response efforts addressing violence in this study population. Furthermore, in Aim 3, many AYA had feelings of depression or suicidal thoughts, or drank alcohol, as a result of their experiences of psychological abuse or sexual violence, which influenced their HIV outcomes. Longitudinal studies will facilitate a deeper understanding of these and other causal pathways.

8.2 Implications for adolescents and young adults living with HIV

At the individual level of our conceptual framework, we found that experiences of violence are related to VL failure among AYA. During IDIs, AYA often described how experiences of psychological abuse and sexual violence prevented them from taking their medication and/or attending their clinic appointments. In addition to directly affecting HIV outcomes, violence victimization may influence youths' ability to manage their HIV through indirect pathways. In line with theories of cumulative trauma and stress,^{153, 159} there may be acute and chronic physiological effects of stress on the immune systems of AYA from repeated experiences of violence.¹⁶⁰ Moreover, violence may lead to depression,²⁵ suicidal ideation,^{25, 27} substance use,^{25, 26} anti-social tendencies,²⁸ and post-traumatic stress disorders¹⁷¹ among AYA; although not a focus of our study, we gained some insight into these pathways during IDIs.

Each of these pathways may play a critical role in a young person's ability to manage his/her HIV infection. Taken another way, these findings suggest that if levels of violence victimization decrease, AYA may be better able to achieve viral suppression, which can lead to an improved quality of life and greater longevity. Viral suppression also decreases likelihood of onward HIV transmission, which for many people living with HIV can bring feelings of liberation from the stigma associated with the virus and a strong sense of agency in their approach to new or existing relationships.¹⁷² Together, these findings reinforce the importance of reducing the impact and preventing violence to improve the health and wellbeing of AYA living with HIV.

8.3 Implications for clinics, homes, communities, and schools

At the community, institutional, and structural levels of the socio-ecological model, efforts to address violence as a barrier to HIV outcomes among AYA should build on the Government of Zambia's strong commitment to violence prevention through law and policy. The 2011 Anti-GBV Act¹²³ represents one of the most comprehensive GBV laws in SSA. The act is designed to protect victims of gender-based violence, establish an anti- gender-based violence committee and fund, create shelters for and provide counseling to adult and child victims of violence, and provide for the issuance of protection orders. It includes provisions for addressing "emotional, verbal and psychological abuse" alongside physical and sexual violence, among both children and adults. The Anti-GBV Act defines emotional, verbal, and psychological abuse as:

A pattern of degrading or humiliating conduct towards a person, including: a) insults, ridicule, or name-calling; b) threats to cause emotional pain or distress; c) the exhibition of obsessive possessiveness which is such as to constitute a serious invasion of the person's privacy, liberty, integrity, or security; or d) any act, omission or behavior constituting gender-based violence which, when committed in the presence of minor members of the family, is likely to cause them mental injury.¹²³

Beyond the Anti-GBV Act, the government has ratified numerous international conventions relating to GBV, including the International Covenant on Economic, Social, and Cultural Rights and the Convention on the Rights of the Child, among others.¹⁷³

Alongside these policies, the government has led and supported large initiatives to prevent GBV since the mid-2000s.^{150, 174, 175} Initiatives have included efforts to strengthen legal and social support for victims of violence, engage men and boys in GBV programming, sensitize community and religious leaders about GBV, and conduct GBV

outreach through community radios, among others.^{150, 174, 175} These initiatives have, in part, attempted to address challenges identified with implementing the Anti-GBV Act. A 2017 report, for instance, highlighted persistent unequal gender norms and attitudes, variation in the quality of counselling services, and gaps in training and awareness of the act among service providers.¹⁷⁶ Furthermore, between 2007 and 2011, the Zambian government established eight one-stop-centers for GBV, prior to the anti-GBV law's passage, with 16 additional units handed over to the government following the USAID Stamping Out and Preventing Gender-Based Violence (STOP GBV) project from 2012-2018.¹⁷⁷

These efforts indicate the seriousness with which Zambia aims to address rates of violence in the country. The reality, though, is that the existing centers cannot meet the overwhelming need for violence-related services across all of Zambia and are often inaccessible to adolescents and young adults.^{176, 178} Similarly, HIV clinics are frequently overburdened meeting the HIV-clinical needs of patients and often do not have the resources or training to address the high prevalence of violence.¹⁷⁹ Moreover, efforts to address violence in Zambia tend to center on women and girls.¹⁷³ This focus is indeed critical given the persistence of gender inequality,¹⁷³ but our findings also highlight a need to address experiences of violence against male AYA living with HIV. They further underscore the importance of examining multiple forms of violence from a range of perpetrators, beyond GBV.

The fact that these HIV-positive AYA are in HIV care represents an important opportunity to identify and address the needs of AYA victims of violence. Our findings point to two key strategies for developing efforts to minimize the effects of violence on

the HIV outcomes of youth, which are detailed below: 1) targeting AYA living with HIV to address their experiences of violence; and 2) developing and testing broader violence prevention and response initiatives for all AYA.

Targeting AYA living with HIV to address their experiences of violence

HIV clinics at the institutional level offer a prime setting for identifying and supporting AYA living with HIV who are victims of violence. Healthcare providers must recognize, in particular, that frequent verbal insults and other forms of emotional mistreatment affects the virologic results of AYA. **Screening for violence** in HIV clinics can allow providers to identify those AYA experiencing violence and at risk of VL failure. Screening tools should include behaviorally-specific questions about multiple types of violence from a range of perpetrators to ensure that the full extent of experiences of violence against AYA are captured. In particular, it is important that screening efforts include psychological abuse in addition to physical and sexual violence. The Abuse Assessment Screening Tool for pregnant women⁹¹ could serve as a model. Violence screening might usefully be integrated into routine clinic service through adaptation and training on the GBV and abuse screening tool within the USAID's AIDSTAR-One Toolkit for the Transition of Care and Other Services for Adolescents Living with HIV, designed for healthcare providers in SSA.¹ This screening tool, though in need of greater specificity around acts and perpetrators of violence, offers a valuable starting point given its consideration of multiple types of violence (i.e. psychological, physical, and sexual),

¹ This toolkit was adapted for use by youth peer mentors to improve viral suppression, ART adherence, and self-stigma among AYA in Project YES! Our team had decided not to incorporate the gender-based violence and abuse screening tool, given that peer mentors are not trained as counselors.

the varying settings in which violence occurs (i.e. home, school, community), and the consequences of violence (i.e. alcohol/drug use, attempted suicide).

Implementing screening protocols for violence will require appropriate training of healthcare providers and sufficient response resources within or available to clinics.^{180, 181} Screening will need to fit within the laws that govern responses to violence, particularly among youth who are defined as minors. Clinics will also need staff trained in counseling and supporting AYA who have experienced violence.¹⁸⁰ Provisions must also be in place to give healthcare providers the time and space to respond to violence, but they often work in constrained clinic settings.¹⁷³ Beyond addressing these institutional-level challenges, we note that providers may need to be trained on broadening their perceptions of what constitutes violence.¹⁸²

Screening for violence may usefully be paired with efforts to address mental health issues among AYA living with HIV within clinic settings. Feelings of depression and thoughts of suicide were prominent among interviewees in Aim 3 and were closely related to experiences of violence. The government of Zambia has supported efforts to strengthen Zambia's mental health services for HIV-positive young people through the implementation of psychosocial support programs.¹⁴⁸ However, researchers have found that mental health services for youth living with HIV are still lacking in many parts of Zambia,^{148, 183} a reflection in part of a lack of mental health workers.¹⁸³ Given the recognized links between mental health issues and experiences of violence among AYA living with HIV in the region,^{30, 31, 139} screening initiatives for violence could be implemented alongside those for mental health.

Other strategies targeting AYA living with HIV the clinic level also merit further testing. Interventions which place peer mentors at clinics, like Project YES!¹⁸⁴ and Africaid's community adolescent treatment supporter program in Zimbabwe,¹⁸⁵ could offer a space for AYA to learn about the consequences of violence and link to violence care—programs that were requested by youth in this study. Care will need to be taken in accounting for ethical considerations, for instance, in the case that an AYA is experiencing violence from his/her parent or caregiver.⁷¹ Clinics can also serve as an avenue for engaging the family members of AYA living with HIV to raise caregivers' awareness of their children's possible violence victimization and the potential negative effects of such violence. Existing interventions working in clinics with this target population^{125, 184} could be adapted for such purposes.

Developing and testing broader violence prevention and response initiatives for youth living with HIV

In addition to targeting AYA living with HIV with violence programming and services within clinics, our findings underscore the need to refine programs at the community level of the socio-ecological model to prevent and reduce violence against general populations of AYA. AYA living with HIV in Zambia live in a country with a high prevalence of violence in the general population,¹¹ and interventions are seeking to reduce these levels of violence across varied settings. Family-based interventions have shown promising results on reducing levels of IPV among caregivers,¹⁸⁶ reducing levels of abuse from caregivers against children,¹⁸⁷ and improving family functioning and positive parenting^{186, 187} among general populations of AYA. Such approaches could

benefit youth living with HIV who are participating in these programs, as well as youth who have not yet acquired HIV.

In addition to targeting the home environment, programs operating within communities for vulnerable youth (e.g. the Adolescent Girls Empowerment Program in Zambia¹⁸⁸) could offer a platform for strengthening the knowledge of youth about the effects of violence and increasing their likelihood of accessing violence services. Moreover, community mobilization strategies for addressing violence (e.g. the SASA! intervention in Uganda, which engages a critical mass of people to change gender norms and reduce IPV¹⁵¹) may help to change norms around violence and engage hard-to-reach family members other than caregivers, whom we identified as key perpetrators of violence against AYA. Such a community-level approach around violence may be particularly useful where family members are unaware of a youth's HIV status, as it would facilitate messaging on violence without requiring disclosure. In a similar vein, interventions seeking to reduce violence in schools (e.g. the Good Schools Toolkit in Uganda¹²⁸) may also have beneficial effects for AYA living with HIV without requiring disclosure of their HIV status. The notable levels of peer violence which we observed, coupled with the associations seen between physical peer violence and VL failure, highlight the importance of investing in approaches to reduce levels of violence from peers, including in schools. Ultimately, pursuing a variety of strategies which cut across multiple levels of the socio-ecological model will be critical to addressing violence against AYA living with HIV in Zambia, with the goal of improving HIV and other health outcomes and reducing the onward transmission of HIV.

Chapter 9. Appendices

9.1 Data collection instruments

9.1.1 Project YES! baseline survey items analyzed in Aims 1 & 2

SOAR TRANSITION STUDY – BASELINE SURVEY			
Q#	Question	Answers	Special Instructions
Introduction			
Thank you for agreeing to participate in the study. I am now going to start asking you questions and recording your responses.			
Patient Identifiers - Study staff fill out			
1.	Site Identification Number	01 ADCH 02 NCH 03 PCC 1 04 PCC 2	
Socio-Demographics			
2.	Participant sex	01 Male 02 Female 88 Refused to answer	
3.	How old are you now?	15 16 17 18 19 20 21 22 23 24 88 Refused to answer	
4.	Have you completed primary school?	00 No 01 Yes 77 Don't know 88 Refused to answer	
5.	How do you think you acquired HIV?	01 From your parents 02 Through sex 03 Another way 77 Don't know 88 Refused to answer	

Family Characteristics			
6.	Is your biological mother alive?	00 No 01 Yes 77 Don't Know 88 Refused to answer	
7.	Is your biological father alive?	00 No 01 Yes 77 Don't know 88 Refused to answer	

Experiencing Violence – Emotional, Physical, Sexual

Young men and women all over the world may experience violence from strangers but also from people they know well, such as a romantic partner, teacher, or family member. The next questions are personal and could be uncomfortable to answer. Remember that you can skip any questions that you would prefer not to answer. The following questions will include things that can happen to young men and women from a range of people, including a romantic partner. By partner, I mean a boyfriend, romantic partner, fiancé, partner, or a husband.

Emotional violence				
Q	Has anyone ever:	A) Yes=01 No=00	B) Who did this to you? <i>Survey administrator should ask each answer option individually. For each answer selected, ask C.</i>	C) How often has this happened in the past 12 months?
8.	Insulted you or made you feel bad about yourself?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
9.	Belittled or humiliated you in front of other people?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

10.	Threatened to leave or abandon you?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
11.	Locked you out of the home?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
12.	Threatened to invoke harmful people, ghosts, or evil spirits against you?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

13.	Referred to your skin color/ gender /religion /tribe or health problems you have in a hurtful way?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
Physical violence				
Q	Has anyone ever:	A) Yes=01 No=00	B) Who did this to you? <i>Survey administrator should ask each answer option individually. For each answer selected, ask C.</i>	C) How often has this happened in the past 12 months?
14.	Slapped you or thrown something at you that could hurt you?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
15.	Pushed you or shoved you?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

16.	Twisted your ear or arm as punishment?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
17.	Hit you with a fist or with something else that could hurt you, such as a stick or cane?	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
18.	Kicked you, dragged you, or beaten you up? (<i>WHO measure of severe physical violence</i>)	00 No 01 Yes 88 Refused to answer	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

19.	Choked you or burnt you on purpose? (WHO measure of severe physical violence)	00 No 01 Yes 88 Refused to answer	Select all that apply: 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
20.	Threatened to use or actually used a sharp object or other weapon against you? (WHO) (WHO measure of severe physical violence)	00 No 01 Yes 88 Refused to answer	Select all that apply: 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

Sexual violence					
Q	Has anyone ever:	A) Yes=01 No=00	B) At what age did this first occur?	C) Who did this to you? Survey administrator should ask each answer option individually. For each answer selected, ask C.	D) How often has this happened in the past 12 months?
21.	Made you watch a sex video or look at sexual pictures?	00 No 01 Yes 88 Refused to answer	Enter age: ____	Select all that apply: 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

22.	Made you look at their private parts or wanted to look at yours?	00 No 01 Yes 88 Refused to answer	Enter age: ____	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
23.	Touched your private parts in a sexual way, or made you touch theirs?	00 No 01 Yes 88 Refused to answer	Enter age: ____	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer
24.	Physically forced you to have sexual intercourse when you did not want to?	00 No 01 Yes 88 Refused to answer	Enter age: ____	<i>Select all that apply:</i> 01 Romantic partner 02 Parent/caregiver 03 Other family member 04 Friend or peer 05 School staff member 06 Employer 07 Health care worker 08 Neighbor 09 Religious leader 10 Stranger 11 Other: _____ 88 Refused to answer	00 Never 01 Once 02 A few times 03 Many times 88 Refused to answer

9.1.2 In-depth interview guide used in Aim 3

In-depth Interview Guide for AIM 2: Safety Interviews

Study Title: Transitioning Adolescents to HIV Self-Management in Zambia (Aim 2 safety interviews)

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Study Sponsor: USAID/Project SOAR/ADCH/Johns Hopkins Bloomberg School of Public Health

JHU IRB#: IRB00007870

Participant Study ID: _____ **Date of Interview (DD/MM/YY):** _____

Interviewer Initials: _____ **Location of Interview:** _____

Interview Start Time: _____ **Interview End Time:** _____

Introduction: Thank you for meeting for this interview. We are doing this work to help the clinic give better care to young people. We want to learn about what it has been like to live with HIV and the things in your life that may affect your living with HIV, especially times when someone has acted violently toward you. We have asked you to come to this interview because you said during the first survey for this project that someone had physically or emotionally hurt you or had forced you to do sexual things you did not want to do. I know it may feel uncomfortable to talk about these experiences. Remember that you do not have to answer any questions that you do not want to, and you can end the interview at any time. Your decision to end the interview will not change your care at the clinic. Also remember that there are no 'right' or 'wrong' answers. We are here to learn from you. I will record our conversation so that I can be sure to remember everything we discuss today. I want to remind you that what you tell me today will *not* be shared with your caregiver. I will need to ask a healthcare provider to speak with you if, for example, you have been seriously hurt by someone else, seem depressed, or are in other danger and have not yet been connected with a healthcare provider by someone in this project. If you are connected to a healthcare provider after this interview, I will need to tell your peer mentor for Project YES! so that they can support you with getting the help you need. Are you okay to begin the interview?

[☐] Yes, participant agrees to proceed with interview.

[☐] No, participant does not agree to proceed.

Interviewer: Tick the appropriate box above. If the participant agrees to proceed, begin the recording. Record your name (as the interviewer), the participant's study ID, date, current time, and interview location. Begin the interview.

□ **Background questions**

- How do you normally spend your day?
 - *Probe:* What kind of things do you have to do for work, at school, or at home?
- Tell me about your living situation.
 - *Probe:* Where do you live? Who do you usually live with? Have you always lived with them?

□ **Living with HIV**

- How did you find out that you were living with HIV?
 - *Probe:* How old were you? How do you think you became HIV-positive?
- Tell me a bit about what it has been like to live with HIV.
 - *Probe:* What is hard about living with HIV? What is easy about living with HIV?
- What, if anything, makes it hard to take your HIV medication every day? What makes it hard to attend your HIV clinic appointments?
 - *Probe:* How easy or hard are these things for you? How much do other people make it hard to take your medication/attend appointments?

□ **Violence and HIV:** When you completed the first survey for this project, we explained that young men and women all over the world may experience violence from strangers but also people they know well, like a family member, romantic partner, school staff member, healthcare provider, or someone else. We asked about a lot of different types of violence, such as being emotionally or physically hurt or being asked to do sexual things you do not want to do. I would like to ask you questions about your experiences and how they have or have not affected you.

- Let us start with a time someone hurt you emotionally or mentally—when someone, for example, insulted or humiliated you, threatened to abandon you, locked you inside/outside the home, or did things to scare or hurt you on purpose. Could you give me an example of a time something like that has happened? What happened?
 - *Probe into what happened and who did it:* Tell me about the situation. Who did this to you? Where and how often did it occur?
 - *Probe into relationship of violence to the participant's HIV status:* How did your HIV status affect this experience? Did this experience occur before or after you learned you were living with HIV? Did the person who did this to you know your HIV status at the time of the experience?
 - *Probe into coping with this form of violence:* How do you feel about this experience? How have you dealt with it? Has anyone helped you? Who? How have they helped?
 - *Probe into community perceptions of the violence:* Tell me what happens when other people in your community, like friends or people who live close to you, learn about what you experienced. How do people react?

How often does this kind of experience happen to people in your community? How normal is it?

- Can you tell me about how this experience has affected you?
 - *Probe into general effects of violence:* Your day-to-day life? Your health? The way you feel? Your body? Your use of alcohol? Your use of drugs?
 - *Probe into effects of violence on HIV care and treatment:* How you feel about having HIV? How you manage your HIV? How you take your HIV medication? How you attend your HIV clinic appointments?
 - Are there any other ways that this experience has affected you?
- Let us now talk about any times someone physically hurt you—when someone, for example, slapped or hit you with something that could hurt you, pushed or shoved you, twisted your ear or arm in punishment, kicked you or beat you up, choked or burnt on purpose, or threatened to use or actually used a weapon against you. Could you give me an example of a time something like this has happened to you? What happened? *Interviewer: Repeat probing questions above.*
- Let us now talk about any experiences of sexual violence—when someone, for example, physically forced you to have sexual intercourse or do sexual things when you did not want to. Could you give me an example of a time something like this has happened to you? What happened? *Interviewer: Repeat probing questions above.*
- Are there other times when you were hurt or punished by someone that you would like to tell me about? *Interviewer: Repeat probing questions above.*

□ **Intervention:** *Interviewer: Only ask these questions to an intervention participant.*

- How, if at all, did your peer mentor help you deal with the things we have just discussed?
- What are other ways the program can help young people like you who have experienced what you have told me about?
- How important is it for the program to help with these experiences as a way of making young people's HIV care better?

□ **Conclusion:**

- Do you have anything else you would like to say about what we have discussed?

Thank you very much for your time.

Chapter 10.

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108. Le T, Holton S, Romero L, Fisher J. Polyvictimization among children and adolescents in low- and lower-middle- income countries: A systematic review and meta-analysis. *Trauma, violence & abuse*. 2016;1(20).
109. Denison J, Burke V, Miti S, Nonyane B, Frimpong C, Merrill K, et al. Project YES! Youth Engaging for Success: A randomized controlled trial assessing the impact of a clinic-based youth peer mentoring program on viral load status, adherence and internalized stigma among HIV-positive youth (15-24 years) in Ndola, Zambia. (Under review at PLOS ONE). 2019.
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111. Strauss M. The Conflict Tactics Scales and Its Critics: An Evaluation and New Data on Validity and Reliability. In: Strauss M, Gelles R, editors. *Physical violence in American families: Risk factors and adaptations to violence in 8145 families*. New Brunswick, WJ.: Transaction Publishers; 1990.
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113. Wilson H, Woods B, Emerson E, Gonenberg G. Patterns of Violence Exposure and Sexual Risk in Low-Income, Urban African American Girls. *Psychological Violence*. 2012;2(2):194-207.
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116. Ramaiya M, Sullivan K, O'Donnell K, Cunningham C, Shayo A, Mmbaga B, et al. A Qualitative Exploration of the Mental Health and Psychosocial Contexts of HIV-Positive Adolescents in Tanzania. *PLOS One*. 2016;11(11).
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121. Espino S, Fletcher J, Gonzalez M, Precht A, Xavier J, Matoff-Stepp S. Violence screening and viral load suppression among HIV-positive women of color. *AIDS Patient Care STDS.* 2015;29(1):S36-41.
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125. Bhana A, Mellens C, Petersen I, Alicea S, Myeza N, Holst H, et al. The VUKA Family Program: Piloting a family-based psychosocial intervention to promote health and mental health among HIV infected early adolescents in South Africa. *AIDS Care.* 2014;26(1).
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128. Devries KM, Knight L, Miriembe A, Child JC, Nakuti J, Jones R, et al. The Good School Toolkit for reducing physical violence from school staff to primary school students: A cluster-randomised controlled trial in Uganda. *Lancet Global Health.* 2015;3(7):E378-86.
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132. Denison J, Koole O, Tsui S, Menten J, Torpey K, Praag E, et al. Incomplete adherence among treatment-experienced adults on antiretroviral therapy in Tanzania, Uganda and Zambia. *AIDS.* 2015;29(3):361-71.

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153. Musicaro R, Spinazzola J, Arvidson J, Swaroop S, Grace L, Yarrow A, et al. The Complexity of Adaptation to Childhood Polyvictimization in Youth and Young Adults: Recommendations for Multidisciplinary Responders. *Trauma, violence & abuse*. 2017;1-10.
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171. Baldry A, Sorrentino A, Farrington D. Post-Traumatic Stress Symptoms Among Italian Preadolescents Involved in School and Cyber Bullying and Victimization. *Journal of Child and Family Studies.* 2019;28(9):2358-64.
172. UNAIDS. Undetectable=Untransmittable: Public Health and HIV Viral Load Suppression. Geneva, Switzerland; 2018.
173. USAID/UKAID. Midterm evaluation: Stamping out and preventing gender-based violence in Zambia. 2015.
174. DFID/USAID. Evaluation of the Stop GBV Programme: 2012-2018. Oxford Policy Management; 2019.
175. USAID. A Safer Zambia Program (ASAZA): Final Evaluation Report. 2011.
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177. USAID. Zambia's Ministry of Health integrates U.S.-funded one-stop centers into fight against gender-based violence: USAID/PEPFAR and UKAID partnership establishes 16 anti-GBV centers, housed in Zambian government health facilities 2018 [Available from: <https://www.usaid.gov/zambia/press-releases/05-15-2018-zambias-ministry-health-integrate-us-funded-antigbvcenters>].
178. Zama M, Dennis M, Price JH, Topp S, Mwansa J, Keesbury J. Mitigating the consequences of sexual violence in Zambia by decentralizing emergency medical responses to police victim support units: Report on the feasibility of police provision of post-exposure prophylaxis for HIV (PEP) in Zambia. Lusaka; 2013.
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180. CRS. Psychosocial Care and Counseling for HIV-Infected Children and Adolescents: A Training Curriculum. Catholic Relief Services; 2009.

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181. Mark D, Armstrong A, Andrade C, Penezato M, Hatane L, Taing L, et al. HIV treatment and care services for adolescents: a situational analysis of 218 facilities in 23 sub-Saharan African countries. *Journal of the International AIDS Society*. 2017;20.
182. Undie C, Maternowska C, Mak'anyengo M, Birungi H, Keesbury J. Routine screening for intimate partner violence in public health care settings in Kenya: An assessment of acceptability. Nairobi, Kenya: Population Council (APHIA II OR Project in Kenya Technical Report); 2012.
183. Lyambai K, Mwape L. Mental Health Problems Experienced by HIV Positive Adolescents; A Case of Choma District, Zambia. *Open Journal of Psychiatry*. 2018;8:97-114.
184. Burke V, Frimpong C, Abrams E, Merrill K, Miti S, Mwansa J, et al. "We just need to continue": Youth peer mentors' experiences implementing Project YES! in Ndola, Zambia. *International Conference on AIDS and STIs in Africa*; Kigali, Rwanda, 2019.
185. Willis N, Milanzi A, Mawodzeke M, Dziwa C, Armstrong A, Yekeye I, et al. Effectiveness of community adolescent treatment supporters (CATS) interventions in improving linkage and retention in care, adherence to ART and psychosocial well-being: a randomised trial among adolescents living with HIV in rural Zimbabwe. *BMC Public Health*. 2019;19(117).
186. Chaudhury S, Brown F, Kirk C, Mukunzi S, Nyirandagijimana B, Mukandanga J, et al. Exploring the potential of a family-based prevention intervention to reduce alcohol use and violence within HIV-affected families in Rwanda. *AIDS Care*. 2016;28(2):118-29.
187. Cluver, Meinck F, Steinert J, Shenderovich Y, Doubt J, Romero R, et al. Parenting for Lifelong Health: a pragmatic cluster randomised controlled trial of a non-commercialised parenting programme for adolescents and their families in South Africa. *BMJ Glob Health*. 2017;3.
188. Austrian K, Hewett P. Adolescent Girls Empowerment Programme: Research and Evaluation Mid-Term Technical Report. Lusaka, Zambia: Population Council; 2016.

Curriculum Vitae

Katherine G. Merrill

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EDUCATION

- PhD Candidate** Johns Hopkins Bloomberg School of Public Health
International Health with focus in Social & Behavioral Interventions
Dissertation: Violence victimization and HIV care and treatment practices among adolescents and young adults living with HIV in Zambia
- MSc** London School of Hygiene and Tropical Medicine
Epidemiology
Thesis: School staff perpetration of physical violence against students in Uganda: A multilevel analysis
- BA** Brown University
Double major in International Development and English Literature
Thesis: Bridging national and cultural differences through sport: The case of the Football for Hope Festival 2010
Phi Beta Kappa, Magna Cum Laude, with Honors

RESEARCH EXPERIENCE

Johns Hopkins Bloomberg School of Public Health 2016-2019 (Baltimore, MD)

Research Assistant

- Supported cross-sectional analyses to examine sources of support among HIV-positive adolescents in Zambia.
- Led secondary analyses of qualitative data exploring the living situations and social support among HIV-positive youth in Baltimore City. Co-drafted a manuscript for publication (near submission).
- Conducted interviews with HIV-positive adolescents in an HIV clinic in Baltimore.

Research Consultant 2015-present (various locations)

Raising Voices, Uganda

- Led an analysis of secondary outcomes for the Good Schools Study, a cluster-randomized trial of an intervention seeking to prevent violence against children in Ugandan primary schools.

London School of Hygiene and Tropical Medicine

- Led an analysis of pre- and post-training survey data to assess discrepant longitudinal reporting of violence against students among school staff in the Cote d'Ivoire.
- Supported cross-sectional analyses of sexual violence care among women in Kenya.

London School of Hygiene and Tropical Medicine**2015-16 (London, UK)***Research Assistant, Violence against Children*

- Managed search strategy for a systematic review and meta-analysis documenting prevalence of age-specific forms of violence against children worldwide and perpetrators of these forms of violence.

Grassroot Soccer (GRS)**2011-14 (South Africa)***Research, Monitoring & Evaluation (RM&E) Manager (2012-2014)*

- Managed data collection systems for sport-based HIV prevention programming for over 600,000 youth across sub-Saharan Africa and globally, building on field office experience in Soweto, South Africa (2011-12).
- Led research initiatives, supported the implementation of three cluster-randomized trials, and facilitated M&E trainings and workshops in 5 GRS country sites (incl. Nigeria, Ukraine, Zimbabwe).
- Managed three RM&E team members and a \$170,000 Johnson & Johnson grant for RM&E activities.

PEER REVIEWED PUBLICATIONS*

1. **Merrill KG**, Merrill J, Hershow R, Barkley C, Rakosa B, DeCelles J, Harrison A. Linking at-risk South African Girls to Sexual Violence and Reproductive Health Services: A Mixed-Methods Assessment of a Soccer-Based HIV-Prevention Programme and Pilot SMS Campaign. *Evaluation & Program Planning*. 2018; 70:12-24.
2. **Merrill KG**, Knight L, Namy S, Allen E, Naker D, Devries KM. Effects of a violence prevention intervention in schools and surrounding communities: Secondary analysis of a cluster randomised-controlled trial in Uganda. *Child Abuse & Neglect*. 2018; 84:182-195.
3. **Merrill KG**, Knight L, Glynn J, Allen L, Devries K. School Staff Perpetration of Physical Violence against Students in Uganda: A Multilevel Analysis of Risk Factors. *BMJ Open*. 2017;0:e015567.
4. **Gannett K**, Kaufman Z, Clark M, McGarvey S. Football with Three ‘Halves’: A Qualitative Exploratory Study of the ‘football3’ Model at the Football for Hope Festival 2010. *Journal of Sport for Development*. 2014; 2(3): 47-59.
5. Gatuguta A, **Gannett K**, Devries K, et al. Missed Treatment Opportunities and Barriers to Comprehensive Treatment for Sexual Violence Survivors in Kenya: A Mixed Methods Study. *BMC Public Health*. 2018; 18(769): 1-18.
6. Devries K, Knight L, Petzold M, **Merrill KG**, et al. Who perpetrates violence against children? A systematic analysis of age-specific and sex-specific data. *BMJ Paediatrics Open*. 2017; 2(1): 1-15.
7. Kayiwa J, Clarke K, Knight L, Allen E, Walakira E, Namy S, **Merrill K**, Naker D, Devries K. Effect of the good school toolkit on school staff mental health, sense of job satisfaction, and perceptions of school climate: Secondary analysis of a cluster randomised trial. *Preventive Medicine*. 2017; 101: 84-90.

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8. Knight L, Nakuti J, Allen E, **Gannett K**, Naker D, Devries K. Are School-Level Characteristics Associated with Students' Experience of Physical Violence from School Staff in Uganda? *International Health*. 2016; 8: 27-35.
 9. DeCelles J, Hershow R, Kaufman Z, **Gannett K**, et al. Process Evaluation of a Sport-Based Voluntary Medical Male Circumcision Demand Creation Intervention in Bulawayo, Zimbabwe. *Journal of Acquired Immune Deficiency Syndromes*. 2016; 72:4: S304-S308.
 10. Hershow R, **Gannett K**, Merrill J, Kaufman EB, Barkley C, DeCelles J, Harrison A. Using Soccer to Build Confidence and Increase HCT Uptake among At-Risk Girls: A Mixed-Methods Study of an HIV Prevention Programme in South Africa. *Sport in Society: Cultures, Commerce, Media, Politics*. 2015; 18(8): 1009-1022.
 11. Merrill J, Hershow R, **Gannett K**, Barkley C. Pretesting an mHealth Intervention for At-risk Adolescent Girls in Soweto, South Africa. In Proceedings of the Sixth International Conference on Information and Communications Technologies and Development: Notes-Volume 2 (ICTD '13), Vol. 2. ACM, New York, NY, 96-99. DOI: 10.1145/2517899.2517933. 2013.
 12. Richards J, Kaufman Z, Schulenkorf N, **Gannett K**, Wolff E, Siefken K, Rodriguez G. Advancing the Evidence Base of Sport for Development: A New Peer-Reviewed, Open-Access Journal. *Journal of Sport for Development*. 2013; 1(1): 1-4.
 13. Devries K, **Merrill KG**, Knight L, Bott S, Guedes A, Butron-Riveros B, Hege C, et al. Violence in childhood in Latin America and the Caribbean: What do available data reveal about prevalence and perpetrators? *Rev Panam Salud Publica*. 2019; 43:e66.
 14. Beres L, **Merrill KG**, McGready J, Denison JA, Sikazwe I, Decker M. Intimate partner violence polyvictimization and HIV among coupled women in Zambia: Analysis of a population-based study (in press at *Global Public Health*).

Submitted for publication or under review

Merrill KG, Campbell JC, Decker MR, McGready J, Burke VM, Mwansa JK, Miti S, Frimpong C, Kennedy CE, Denison JA. Prevalence and perpetrators of violence against adolescents and young adults living with HIV in Zambia (under review at *PLOS ONE*).

Merrill KG, Smith SC, Quintero L, Devries K. How stable are reports of violence perpetration over time? Response biases in data from teachers in Cote d'Ivoire (under review at *Child Abuse & Neglect*).

Robinson A, Stephenson R, Morse S, **Merrill K**, Surkan PJ. Missed opportunities for addressing intimate partner violence through microcredit: Qualitative findings from Bangladesh (under review at *Violence against Women*).

Denison JA, Burke VM, Miti S, Frimpong C, **Merrill KG**, Abrams E, Mwansa JK. Impact of peer mentoring on viral suppression and internalized stigma among HIV-positive adolescents and young adults in Ndola, Zambia: Project YES! Youth Engaging for Success RCT Results (under review at *PLOS ONE*).

Devries K, Balliet M, Knight L, Procureur F, Ndjore AH, N'Guessan D, Thornhill K, **Merrill K**, et al. Learn in peace, educate without violence: Preliminary evidence for the effects of a brief, school-based violence prevention intervention in Cote d'Ivoire (submitted to *Social Science and Medicine*).

RESEARCH GRANT PARTICIPATION

Title: **Violence Victimization and HIV Care and Treatment Practices among Youth Living with HIV in Zambia**

Dates: 8/17/2018 – 2020

Sponsoring Agency: National Institute of Mental Health (NIMH)

Grant number: 1 F31 MH116821-01A1

Funding Level: \$220,243

Role: Principal Investigator

Description: Assessing the relationship between violence victimization (physical, psychological, sexual) and HIV outcomes (viral load, medication adherence) among 272 youth living with HIV in Zambia, using mixed methods.

Title: **Violence and HIV care and treatment practices among youth in Zambia: Secondary data analyses and qualitative sub-study for the Project YES! Youth Engaging for Success! research study**

Dates: 8/1/2018-6/30/2019

Sponsoring Agency: Project SOAR, USAID

Funding Level: \$86,807

Role: Gender-based violence consultant

Description: Builds on a randomized controlled trial of a peer-mentoring intervention to explore the intersection of violence and HIV self-management among 15-24-year-old youth living with HIV (YLHIV) in Zambia.

Title: **Supporting implementation science research of a referral safety plan for HIV-positive youth in Zambia**

Dates: 6/18/18-9/30/19

Sponsoring Agency: National Institute of Mental Health (NIMH) through Johns Hopkins Center for AIDS Research (JHU CFAR)

Grant number: P30AI094189

Funding Level: \$5,000

Role: Student investigator

Description: Examining implementation of a safety protocol for youth reporting experiences of violence and suicidal ideation within a randomized controlled trial in Zambia.

HONORS AND AWARDS

2019	International Conference on AIDS and STIs in Africa: Best Abstract Award for Track D [\$1,000]
2019	Richard Morrow Endowed Scholarship Fund in Health Systems [\$4,000], <i>Johns Hopkins</i>
2018	Center for Qualitative Studies Dissertation Enhancement Award [\$2,000], <i>Johns Hopkins</i>
2018	Mary and Carl Taylor Fund [\$1,500], <i>Johns Hopkins</i>
2017	Global Health Established Field Placements [\$2,500], <i>Johns Hopkins</i>
2017	SOURCE Community Engagement Student Group Award, <i>Johns Hopkins</i>
2011	Phi Beta Kappa Society inductee, <i>Brown University</i>
2011	Magna Cum Laude with Honors, <i>Brown University</i>
2011	Watson Associates inductee, <i>Brown University</i>
2010	Brown International Scholars' Program [\$5,000], <i>Brown University</i>
2009	Royce Sport in Society Fellowship [\$2,500], <i>Brown University</i>

EDITORIAL ACTIVITIES

Journal of Sport for Development

2011-present (various locations)

Co-Founder, Managing Editor, and Editor

- Co-launched an open-access, peer-reviewed journal in 2011 to advance research and best practice in sport for development in disability, education, gender, health, livelihoods, peace, and cohesion.
- Managed the submission process as *Managing Editor* (2011-2018), including processing over 140 manuscripts, liaising with over 200 authors and reviewers, and overseeing the publication of 9 journal issues.
- As *Editor* (2018-present), set and maintain the journal's editorial direction, oversee the screening/review of submissions, ensure a high quality and rigorous review process, and govern the work of the Editorial Board.

TEACHING EXPERIENCE

Johns Hopkins Bloomberg School of Public Health

2016-2017 (Baltimore, MD)

Teaching Assistant, International Health Department

- Led weekly discussion section and assessment for 22 Masters and PhD students for the course, “Health Behavior Change at the Individual, Household, and Community Levels.”
- Supported 28 Masters and PhD students with qualitative projects in Baltimore and gave two lectures over three terms for the course, “Qualitative Research Practicum I-III.”
- Provided detailed feedback and assessment for 12 Masters and PhD students and gave one lecture for the 29-person course, “Formative Research for Behavioral and Community Interventions.”

GUEST LECTURES

Johns Hopkins Bloomberg School of Public Health

2018 (Baltimore, MD)

- *Qualitative Research Practicum I*: Title of lecture: “Developing interview, focus group, and observation guides”
- *Formative Research*: Title of lecture: “Make the Cut: Sport-based demand creation for voluntary medical male circumcision (VMMC)”

Johns Hopkins School of Nursing

2018 (Baltimore, MD)

- *Special Topics in Violence Research*: Title of lecture: “Violence victimization and HIV care and treatment practices among youth living with HIV in Zambia.”

SCIENTIFIC PRESENTATIONS AND POSTERS*

Oral Presentations

1. **Merrill KG (presenter)**, Campbell JC, Decker MR, McGready J, Burke VM, Mwansa JK, Miti S, Frimpong C, Kennedy CE, Denison JA. Violence victimization and viral load failure among HIV-positive adolescents and young adults in Ndola, Zambia: A mixed methods study. Oral presentation at: International Conference on AIDS and STIs in Africa; 2019; Kigali, Rwanda.

2. Denison JA, Burke VM (presenter), Miti S, Frimpong C, **Merrill KG**, Abrams EA, Mwansa JK. Impact of peer mentoring on viral suppression and internalized stigma among HIV-positive adolescents and young adults in Ndola, Zambia: Project YES! Youth Engaging for Success RCT Results. Oral presentation at: International Conference on AIDS and STIs in Africa; 2019; Kigali, Rwanda.

3. **Gannett KR (presenter)**, Kaufman Z, Clark M, McGarvey S. Football with Three “Halves”: An Evaluation of the “football3” Fair Play Methodology at the Football for Hope Festival 2010. Oral presentation at: 2nd International Sport and Development Conference; 2011; Cape Town, South Africa.

Posters

1. **Merrill KG**, Campbell JC, Decker MR, McGready J, Burke VM, Mwansa JK, Miti S, Frimpong C, Kennedy CE, Denison JA. Past-year violence victimization is associated with viral load failure among youth living with HIV in Zambia. Poster presented at: Inter-Center for AIDS Research (CFAR) HIV & Women Symposium; 2019; Chicago, IL.

2. **Merrill KG**, Campbell JC, Decker MR, McGready J, Burke VM, Mwansa JK, Miti S, Frimpong C, Kennedy CE, Denison JA. Implementation of a safety protocol within a randomized controlled trial to support HIV-positive adolescent and young adult victims of violence in Ndola, Zambia. Poster presented at: International Conference on AIDS and STIs in Africa; 2019; Kigali, Rwanda.

3. **Merrill KG**, McCarraher D, Packer C, Nyambe N, Mercer S, Mwansa J, Denison J. Coerced first sex among adolescents living with HIV in the Copperbelt, Zambia: Cross-sectional analyses of prevalence and associations with ART adherence, depression, and

alcohol use. Poster presented at: XXII International AIDS Conference; 2018; Amsterdam, Netherlands.

4. **Gannett K**, Merrill J, Hershow R, Muyebe S, Barkley C, DeCelles J, Harrison A. Linking at-risk South African Girls to Sexual Violence and Reproductive Health Services: A Mixed-Methods Assessment of a Soccer-Based HIV-Prevention Programme and Pilot SMS Campaign. Poster presented at: XX International AIDS Conference; 2014; Melbourne, Australia.

5. Burke VM, Frimpong C, Abrams EA, **Merrill KG**, Miti S, Mwansa, JK, Denison JA. “We just need to continue”: Youth peer mentors’ experiences implementing Project YES! in Ndola, Zambia. Poster presented at: International Conference on AIDS and STIs in Africa; 2019; Kigali, Rwanda.

6. Decelles J, **Gannett K**, Kaufman Z, Bhauti K, Harrison A, Ross D. Perceptions of a Soccer-Based Intervention to Increase Voluntary Medical Male Circumcision Uptake in Zimbabwe: A Qualitative Study. Poster presented at: International Conference on AIDS and STIs in Africa (ICASA); 2013; Cape Town, SA.

7. Braunschweig E, **Gannett K**, Kaufman Z, Nkosi Z, Henkels A, Brady M. Mixed-Methods Evaluation of Soccer-Based HIV Prevention for Adolescent Girls in South African Townships. Poster presented at: XIX International AIDS Conference; 2012; Washington, D.C.

8. Hershow R, Merrill J, **Gannett K**, DeCelles J, Friedrich K, Tsegaye E. The Road to National Adoption: A Mixed Methods Study of Grassroot Soccer’s Sport for Life Partnership Programme in Ethiopia. Poster presented at: 18th International Conference on AIDS and STIs in Africa (ICASA); 2015; Zimbabwe.

LANGUAGES

French (fluent) • Spanish (proficient)

**Some publications and conference posters are listed under my maiden name: Katherine R. Gannett.*